Neural Correlates of Cross-Cultural Adaptation

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How to Improve the Training and Selection for Military Personnel Involved in Cross-Cultural Interactions

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The ability to rapidly understand, adapt, and achieve goals in cross-cultural interactions is a critical skill for those engaged in various forms of irregular warfare. The goal of this study was to better understand the culture-general skills and traits needed to conduct successful cross-cultural interactions when lacking prior in-depth knowledge of the other culture.

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EXECUTIVE SUMMARY

The ability to rapidly understand, adapt, and achieve goals in cross-cultural interactions is a critical skill for those engaged in various forms of irregular warfare. Military services, particularly the US Army and Marine Corps, desire to determine and better understand the culture-general skills and traits needed to conduct successful cross-cultural interactions across unforeseen cultures in order to improve their training and selection process. Once these skills are identified, policies and procedures can be implemented to better assess and select as well as train servicemembers to improve the likelihood of mission success. If these skills are not trainable, there is the possibility of selecting people based on their aptitude on these skills or based on traits they possess that correlate with these skills.

The goal of this study was to better understand the culture-general skills and traits needed to conduct successful cross-cultural interactions when lacking prior in-depth knowledge of the other culture. JHU/APL conceptualized the study in three phases: (1) a behavioral study with active-duty and recently retired active-duty military; (2) a functional neuroimaging study with a college-student population; and (3) data analyses of a historical dataset on US Army Special Forces Assessment and Selection candidates. The second phase was designed to immediately follow the first phase, but regulatory hurdles prevented any data from being collected in the first two phases, so results are only available for Phase 3.

Study 1. In the first phase of this project, an experiment was designed to detect cross-cultural adaptation expertise and to compare and contrast expert and non-expert traits and skills. After the experiment was designed, obtained local institutional review board approval, and developed in preparation to run participants, ONR then ultimately determined that this project should not pursue human-subject testing. This study was designed to be a behavioral study designed for active-duty military and recently-retired military. This study would have been conducted online to maximize the number of personnel who could volunteer. This study would have asked about a range of behavioral and personality characteristics including intellect (general fluid intelligence or GFI) and the ability to make sense of complicated situations with a cultural component to the complicated situation, referred to as cultural sensemaking; it would also have asked about what participants believed were the ideal skills to interact with people from other cultures. An important aspect of this first study was to have obtained data about who succeeds at adapting across cultures. There is currently no operational record (or empirical data) about who succeeds at cross-cultural interactions; as a result, military services are unable to assess and select for or train these skills. In order to obtain objective data about these skills, participants would have been allowed to nominate people who they felt best personified being adroit at cross-cultural interactions. With these nominated individuals, JHU/APL would then be able to compare their skills and traits with non-nominated individuals to better determine those skills and traits that differentiate experts from non-experts.

After obtaining local Institutional Review Board (IRB) approval for this study, JHU/APL identified multiple potential stakeholders and discussed this study with them. This included stakeholders in the Marines, Navy Special Warfare Command (WARCOM), Army Research Laboratory (ARL) and US Army John F. Kennedy Special Warfare Center and School (JFKSWCS). JHU/APL received an endorsement from the US Marine Corps (USMC) Center for Advanced Operational Culture Learning (CAOCL), whose procedural and domain expertise made significant contributions to the study design. However, ONR ultimately opted not to pursue human-subjects testing in this project, so no data was obtained.

Study 2. A functional magnetic resonance imaging (fMRI) study was planned that focused on analyzing skills needed for cross-cultural interactions that may be affected when under intense pressure. This study was designed to examine both cross-cultural non-verbal communication ability as well as the ability to regulate moral emotions. Emotion regulation is a critical skill for mission success, but is not amenable to testing via self-reports due to cultural norms preventing honest assessment of emotions as well as because the process of regulating emotions can be below conscious awareness. An in-lab fMRI study would allow different regulatory strategies to be determined, though, and these different strategies could be critical to performance in high-stress environments. To examine cross-cultural non-verbal communication ability, the study utilized a custom-designed variation of the Reading the Mind in the Eyes (RMES) task. This task would be performed in both high and low-workload conditions, to better simulate how performance would be affected in the high-stress environments military personnel have to perform in.

Stimuli for this experiment were developed and the experimental design was completed. However, once ONR determined that this project should not pursue human-subjects testing, efforts to finalize this study and obtain local IRB approval ceased and the project switched focus.

Study 3. After ONR determined that this project should not pursue human-subject testing, JHU/APL re-examined how to proceed. A historical, de-identified dataset was identified that met the spirit of this project, and because the dataset was de-identified it did not constitute human subjects research. The dataset was from JFKSWCS and contained the metrics and outcomes for 6,112 soldiers who attempted the Special Forces Assessment and Selection (SFAS) course in FY13 and FY14. The unit responsible for SFAS, 1st Battalion, 1st Special Warfare Training Group (Airborne) (1st Bn, 1st SWTG(A)) was integral to the design of this study and their specific desire was to improve their SFAS process but they also had a generalized interest in identifying and training cultural adaptability. After ONR approved of JHU/APL working with JFKSWCS to examine their SFAS dataset, JHU/APL used machine-learning techniques to analyze current SFAS process and communicated its findings to 1st Bn, 1st SWTG(A)). JHU/APL examined around 40 variables for each individual ranging from purely cognitive measures of that individual such as full-scale IQ score to purely physical measures such as two-mile run time. JHU/APL determined that SF selection was based on just two variables related to a single skill, land navigation ability. SFAS outcome could be determined just based on these two variables without any loss of accuracy compared to using all the variables, indicating that these two variables are driving the selection process.

The Neural Correlates of Cross-Cultural Adaptation (NC3A) project was a missed opportunity for both ONR (to support) and JHU/APL (to execute) scientifically rigorous, operationally relevant psychological research. In general, there is still a need to have expertise classified so that skills and traits that separate expert performers from non-experts can be better discerned, in order to aid in training those skills or selecting for those traits.

Looking to the future, there are still benefits to the military in proceeding with Study 1; the experiment is designed and ready to be conducted once the regulatory approvals are obtained. A second direction is to focus on analyzing data from the Special Forces; not just from their SFAS course, but from follow-up performance metrics such as how the soldiers perform in the Special Forces Qualification Course (SFQC).

1 INTRODUCTION AND OVERVIEW

1.1 INTRODUCTION

Modern warfare is an inherently uncertain form of competition (Boyd, 1976) where consequential decisions are often based on incomplete, inaccurate, or even contradictory information (HQMC, 1997); thus, decision-making is the crucial, principal human factor in warfare (Krulak, 1999). Decision-making, particular in irregular warfare, often requires interaction with persons of a different culture; be they as a source of information, an individual whom a servicemember is advising, or non-combatants who will endure the consequences of a decision. Improving the capacity for individual decision-making in combat has been identified as a Department of Defense (DOD) operational need (HQMC, 2011), as well as the ability to interact with persons of another culture in order to acquire the information necessary to make such decisions. Hence, there is considerable civilian and military interest in determining which individuals are best suited for working abroad. Much of the research focuses on long-term acculturation, which is most applicable when migrating to one particular culture (see, for example, Berry, Poortinga, Segall, & Dasen, 2002). However, for certain types of jobs, individuals are required to go to multiple locations and spend a relatively short amount of time (on the order of months) at each place thereby prohibiting integration and familiarization with that native culture. Despite the constraints of the length of time within each cultural environment, the assignments demand extensive and often high-stake interactions with locals. These circumstances can be difficult and are often emotionally charged and fragile (Goodwin, 2005). JHU/APL refers to the ability to succeed in this type of short-term scenario as "cross-cultural adaptation."

For in-extremis missions where specific cultural and/or linguistic expertise is not available (if not organic to a unit), general-culture competency and skills such as knowledge about the typical schedule and food preferences are sufficient. However, there are short-term missions for which these culture-general skills are insufficient and culture-specific skills are required to assure that one's mission is accomplished. For example, the skills required for a Francophile to successfully immigrate and integrate into French culture is very different than the skillset required to work in France for three weeks, work in Italy for two months, then consult in China, etc. Living and working in so many different cultures can be particularly stressful, as one never has a chance to acculturate sufficiently to feel comfortable in that particular culture. It also requires the ability to assimilate information quickly; not only to learn about the culture rapidly, but also to adjust one's knowledge of the culture as one interacts with people from that culture.

To address this important DOD operational need to understand cross-cultural adaptation, JHU/APL was funded by the Office of Naval Research (ONR) to study the requirements for successful cross-cultural interactions. JHU/APL began by evaluating previous research conducted on related research, such as cross-cultural competence, where interviews with active-duty military were conducted and synthesized. After the literature review, an initial study was

designed to determine whether experts and non-experts differed along a number of the dimensions hypothesized in that literature and by JHU/APL. A second study was planned that would build on the first study, but be designed to be a laboratory study to examine performance for particular skills that are hard to test via self-report studies as well as when under heavier cognitive workload. Finally, a third study was conducted that examined the assessment and selection process of, the US Army Special Forces, a community whose missions require them to interact with people from many different cultures. The goal of this study was to better understand the current selection process so that the process can continue to improve.

A general framework for cross-cultural psychology (Vaughn & Phillips, 2009) has identified three major requirements for successful cross-cultural interactions: intrapersonal competence, interpersonal competence, and cultural competence. Intrapersonal competence refers to the knowledge of one's self and individual mental skills such as self-control, openness to new situations, and levels of intelligence. Interpersonal skills focus more on social skills. Of note is the fact that it has been clearly demonstrated that those who lack interpersonal skills within a mono-cultural situation will demonstrate poor cross-cultural skills as well (Bochner, 2003). Cultural competence includes culture-specific knowledge such as proficiency in the appropriate language and the awareness of cultural norms and taboos; it also encompasses more universal abilities such as adapting well in changing circumstances and making sense of unfamiliar social environments (Vaughn, 2010).

A key intrapersonal skill is the ability to regulate one's own emotions. Most relevant for military personnel, who are often forced to interact with powerful but difficult others, is regulating one's own moral emotions, such as anger and disgust (Greene & Haidt, 2002; Haidt, 2003). For example, military personnel have often had to interact with local warlords, who locally may treat women and children in a way likely to offend people with Western values. However, because the mission may rely on working with these warlords, these military personnel often have to control their own feelings in order to accomplish the overall mission, a very difficult task. In fact, this very problem has been reported recently with the revelation that two Special Forces soldiers were punished for assaulting and Afghan police officer who had reportedly abused a child (http://www.nytimes.com/2015/09/21/world/asia/us-soldiers-told-to-ignore-afghan-allies-abuse-of-boys.html?_r=0).

In terms of interpersonal skills, a great deal of attention has been focused over the past fifteen years on *social mindreading* which generally refers to an individual's ability to infer the internal mental states (e.g., worried, afraid, puzzled) of another person and to use that inferred state to predict that person's likely actions. Also referred to in the literature as "theory of mind" or "mentalizing," a major deficiency in social mindreading skill is believed to lie at the heart of the social deficits of those suffering from autism spectrum disorder (Apperly, 2012; Baron-Cohen, Leslie, & Frith, 1985; Frith & Frith, 2006). It has been postulated that mindreading may be one of the most important, as well as one of the most vulnerable, of all interpersonal social skills (Adolphs, 2010).

Cultural competence, the third of the Vaughn & Phillips (2009) triad, is not as easily reduced to a specific skill. However, early work by Sieck and his colleagues (2008) focused attention on the high-level skill of sensemaking as originally proposed by Klein and his colleagues (1993) and refined by Weick (1995). Sensemaking is the idea that people interpret a situation by fitting incoming information into a frame that links them to other elements (Klein, Phillips, Rall, & Peluso, 2004). This is related to the notion of cognitive flexibility because individuals must be able to hold many frames in mind and test these various frames against incoming information. The Sieck focus on *cultural sensemaking* (2008) is a natural fit to the cultural competence leg of the triad and is the third major focus of this study.

Previous research regarding cross-cultural adaptation is based on self-reported data (either interviews or questionnaires) to discover so-called "critical components" of culture-general adaptability. However, self-report studies have significant risks that often cause the results to have low reliability. This complicates the ability to clearly identify the underlying factors associated with success or failure in cross-cultural interactions; low reliability in the self-reported results may also account for the poor agreement across these studies about which factors are the most critical for cross-cultural adaptability. For instance, college students who scored high in emotional stability and cognitive flexibility reacted more positively to a stressful intercultural situation relative to students scoring low in emotional stability and cognitive flexibility, based on the multi-cultural personality questionnaire (van der Zee, van Oudenhoven, & de Grijs, 2004). In a study of peacekeepers, Vanderpool (2002) reported that attention to interpersonal relations and being open to new experiences, as assessed by the cross-cultural adaptability scale, accounted for the greatest variability in achievement of their mission. Ross and colleagues (2010) administered the cross-cultural competence inventory test to military personnel and reported that cognitive flexibility, cross-cultural empathy, openness, and a willingness to engage with other cultures were the key factors for success in tasks requiring cross-cultural adaptation. Although the specific results of these three studies were not identical, cognitive flexibility and openness were commonly identified as key to cross cultural competence.

To avoid the problems associated with relying solely on self-report data and the resulting metrics, the specific psychological instruments and tasks used in this project focus on the objective assessment of cross-cultural adaptability. To this end, JHU/APL intended to administer performance-based tasks to experts and non-experts in cross-cultural adaptation, while also administering those personality questionnaires used in the previous literature in order to test their findings that certain traits differentiate experts from non-experts. These tasks, along with the necessary procedures for conducting them and analyzing the resultant data, are discussed in more detail below.

In order to obtain the necessary regulatory approvals to conduct the planned experiments, after obtaining local IRB approval, JHU/APL met with and discussed the research aims with numerous teams throughout the military branches. For example, JHU/APL discussed the research with the US Marine Corps Center for Advanced Operational Culture Learning (CAOCL), who endorsed the research and committed to not only helping to obtain the regulatory approvals necessary for the project but also supporting the execution of the study. JHU/APL also

met with the USMC IRB Chair to discuss recruiting, and prepared documentation on the recruitment process. JHU/APL further met with Marine Corps University (MCU), who agreed to serve as survey sponsor for the first study. Ultimately, ONR opted not to submit this project to HRPO for approval to engage in human-subjects testing.

In attempting to obtain the regulatory approvals, JHU/APL discussed their research with the Army Research Lab (ARL) and with personnel at the John F. Kennedy Special Warfare Center and School (JFKSWCS) at Fort Bragg who are tasked with training Special Forces personnel. The interest from JFKSWCS was particularly well-matched because Special Forces (SF) soldiers often operate in environments where they are required to interact with locals, but are unable to prepare in advance for a particular culture due to limited or no advance knowledge of which culture that would be. In fact, JFKSWCS had already begun investigating improvements to cross-cultural interaction ability of their personnel; as part of their Special Forces Assessment and Selection (SFAS) process, they had collected data on a range of traits and abilities, both physical and psychological, to try to improve their selection process for Special Forces. Specifically, in FY2015 SFAS administered the Cultural Intelligence Scale (CQS): a 20-item self-report instrument that has four metacognitive items, six cognitive items, five motivation items, and five behavioral items (Ang et al., 2007). Additionally, Phase 1 of the Special Forces Qualification Course (SFQC) includes training on Cross-Cultural Communication; this module, required of both officers and each of the enlisted pipelines, may provide an interesting outcome measure using the CQS as a predictive variable and should be a consideration for future research.

During the project period, JFKSWCS provided JHU/APL with anonymized data to analyze in order to help SF better understand their ongoing training process. JHU/APL was able to ascertain that the focus was not on certain psychological variables that may be important for ultimate performance of cross-cultural interactions, but on two particular land navigation tasks that combine physical ability with executive functioning, especially the planning ability.

1.2   OPERATIONAL CONTEXT

There has been a clear operational need to be able to adapt to various cultures since the end of the Cold War. Currently, there are numerous flashpoints around the world where the US military could be sent to operate: places as diverse as East Africa (e.g. Somalia), North Africa (e.g. Libya), the Middle East (e.g. Yemen), Central Asia (e.g. Afghanistan), and Eastern Europe (e.g. Ukraine). In all of these places, interactions with locals are important in order to obtain information, work with counter-insurgents, and to make lasting changes. But how to train US forces who may have to interact with African warlords one month and then Afghan village elders the next? There is not enough time between location shifts to familiarize soldiers with the different cultures, so instead either the soldiers do not have significant interaction with the locals or the interactions are not effective to achieve mission goals; hence, the need to find the culture-general abilities that are needed to succeed in these complex interactions.

The role of identifying such matters for the US Marine Corps falls to the CAOCL who were not only interested in the research topics focused on by JHU/APL as part of the NC3A project, but

were active supporters of it. In fact, CAOCL shared a draft of a set of skill metrics that they independently determined were important for Marines to possess when interacting with other cultures. Their list of skills overlapped considerably with those JHU/APL planned to examine in Study 1, as seen in Table 1. "D" indicates skills that would have been measured directly while "I" indicates indirectly measured skills.

Table 1. Intersection of CAOCL Cultural Skills and NC3A Study 1 Measures

CAOCL Cultural Skills	NC3A Phase I Measures										
	Letter Sets	Calendar Test	Following Directions	Cultural Sensemaking	Multidimensional Questionnaire Short-Form (MPQ-40)	Emotion Regulation Questionnaire (ERQ)	Emotional Intelligence Scale (EIS)	Cultural Intelligence Scale (CQS)	Need for Cognition Scale (NFCS)	Moral Foundations Questionnaire (MFQ)	Moral Vignettes
Cultural Sensemaking				D							
Perspective Taking				I	I					I	I
Observation											
Maintaining Tact & Bearing						D	D			D	D
Cultural Self-Awareness					D			D	I		
Trouble Recovery											
Suspending Judgment				I							

The JHU/APL study design focused on identifying credible experts at cross-cultural interactions, a difficult skill to measure in a way useful to military forces. By determining the skills and traits possessed by credible experts, the study aimed to identify ecologically valid skills and traits that help determine cross-cultural adaptation expertise. Some of the CAOCL cultural skills would be hard to determine solely from a behavioral assessment, however. Consider the components involved in maintaining tact and bearing, for example. To maintain tact in difficult situations requires being able to regulate emotions while under duress. A self-report questionnaire asked in low-stress environment is unlikely to predict how a person would respond in a high-stress situation. Furthermore, there are cultural norms in the military that lead many to not answer questions about their emotions forthrightly, preventing the self-report assessment from being accurate. A second experiment was planned to better assess those skills and traits that require more in-depth testing than could be elicited just from a behavioral assessment.

1.3   SCOPE AND CONSTRAINTS OF WORK CONDUCTED

JHU/APL conducted a pilot study on a custom-designed cultural sensemaking task, and then planned to conduct two experiments: (1) an online behavioral assessment conducted with active-

duty military personnel, and (2) an fMRI study conducted with college students who would also take the online behavioral assessment from the first experiment.

As these experiments would be conducted on human subjects, a rigorous process had to be undertaken to make sure that the experiments would be ethical and safe for the subjects. Whenever a study is conducted on active-duty military, the process requires not only Institutional Review Board (IRB) approval from the local institute, but also approval from a Human Resources Protection Officer (HRPO) at ONR. Initially the focus of this project was on obtaining local IRB approval from Johns Hopkins University, which was obtained in June 2013. After this, preparations were made to obtain HRPO approval. In addition to providing the necessary paperwork to ONR, JHU/APL met with various other stakeholders in the military. This included the USMC IRB Chair who, upon review of the materials provided did not detect any scientific, administrative, or operational problems with the design. JHU/APL also met with representatives from CAOCL, who provided both regulatory and procedural guidance. Despite the support of CAOCL, the USMC IRB Chair, and the Marine Corps University, ONR opted not to submit this project to the HRPO for review.

After being informed that ONR had decided not to submit the IRB approved protocol for HRPO approval, the project plan had to be revised to complete the task without use of human-subjects research, while still working within the scope of this project. JHU/APL, in coordination with an ONR program manager (for this approval, see Appendix D: Approval from ONR to Conduct Study 3), determined that studying historical, anonymized data from the Special Forces would be relevant because of the steps that they had already taken to improve their selection process in order to identify skills and traits for better-qualified cross-cultural adaptable personnel. Thus the NC3A project was adapted to analyze data provided to JHU/APL by Special Forces.

2   STUDY 1: ONLINE BEHAVIORAL STUDY

2.1   BACKGROUND, OBJECTIVES, AND SCOPE

The goal of Study 1 was to determine the skills and traits associated with better ability at culture-general cross-cultural adaptation, with a specific focus on military personnel. The study would test and verify some of these traits and skills that previous literature indicated may be relevant. Critically though, JHU/APL would also obtain a measure of expert and non-expert performance on cross-cultural adaptation.

There is currently no clear, objective measure of cross-cultural adaptation ability, rendering it difficult to determine an individual's level of ability. The plan was to utilize peer evaluation and recommendation to the extent possible. JHU/APL would ask military personnel for recommendations on who they would consider adroit at cross-culture interactions, and then test the skills and traits of those people nominated as experts, while also soliciting volunteers who were not nominated as the non-expert comparison group. Comparisons would then be made on expert and non-expert characteristics.

In order to perform a meaningful analysis, JHU/APL needed to obtain approximately 50 experts and 150 non-experts. Therefore, JHU/APL designed an openly-accessible internet survey that would be accessible to anybody with an internet connection, but would only recruit those from a military population or those recently retired from the military in the last five years to participate. Although an internet survey restricted some of the types of tests that JHU/APL could perform (for example, any tests that utilized reaction time, which could have been compromised by internet lag times), JHU/APL determined the internet survey was the best solution to obtain the highest participation rate. Figure 1 is the homepage of the proposed online study.

Figure 1: Homepage of Study 1

As for the online study itself, JHU/APL primarily used established tests taken from the literature for the stimuli. In addition to these established tests, JHU/APL also created a custom cultural sensemaking task that would be performed online. Cultural sensemaking is one of the big three cultural competences that JHU/APL determined were critical for mission success. However, there is no established method to objectively test cultural sensemaking ability, so JHU/APL designed a test of cultural sensemaking ability.

2.2   DETERMINING CROSS-CULTURAL ADAPTATION EXPERTS

Interviews with military personnel who have served abroad reveal that being able to easily and quickly adapt to unfamiliar cultures is critical for mission success. However, identifying the skills and traits necessary to easily and quickly adapt to a culture are far trickier. The problem is that there is no established way to objectively measure cross-cultural adaptation ability. Without that measure, there is no way to empirically test which skills and traits significantly affect cross-cultural adaptation performance.

The primary goal of this project was to determine a way to rectify this situation by identifying expert skills and traits that could be objectively analyzed through various tests that were expected to correlate with performance. The proposed JHU/APL solution required the use of active-duty military to test hypotheses on the actual population of interest rather than utilizing college students or other proxies. But even with active-duty military participants, it was still necessary to determine expertise in order to make meaningful comparisons.

JHU/APL designed the experiment to incorporate a snowball sampling procedure in order to obtain the requisite experts. In snowball sampling, a participant is asked and encouraged to recommend others to also participate who are in turn then invited to participate in the experiment. For this study, participants would have been asked to nominate people they knew, and whom they considered the best at cross-cultural interactions; i.e., the person(s) they would turn to if they were experiencing problems. The nominees would then be asked to participate in this experiment and be classified as experts. Any participants not nominated would then be considered non-experts. Although this type of recruitment process is unorthodox, JHU/APL argued it was the best way to determine expertise, and this recruitment procedure was approved by the Johns Hopkins IRB.

There are clear advantages and disadvantages to this technique. The disadvantage is that this method is subjective and unverifiable as participants could easily nominate participants who are not true experts due to the initial participant's limited experience or exposure. One advantage is that the people who are nominated are considered experts by their own peers, and expertise is otherwise quite difficult to determine with the already difficult-to-recruit military population. This type of nomination process provides some ecological validity that the results of this study would be of some utility to actual military forces. Second, this technique prevents the circular reasoning of pre-selecting 'experts' based on performance on certain skills and traits that the researchers believe to be critical for expertise. For example, in this project it has been hypothesized that emotion regulation was critical for successful cross-cultural adaptation. To test this hypothesis, experts and non-experts would be compared and experts would be examined to see if they score higher on emotion regulation ability. However, if expertise was determined based on the ability to regulate emotions, then clearly the result would be that people who scored higher in cross-cultural adaptation expertise score higher in emotion regulation ability. But this result would be driven by the way experts were selected, as the selection process was not independent of the hypothesis. If future training and selection then focused on this ability, this could very well have detrimental effects on military preparedness by wasting resources. An

independent sample to test hypotheses is thus highly valued. Finally, this technique can be very effective in a case where the abilities may be highly variable. A person who was successful in Afghanistan may possess different skills than a person who was effective in Nigeria, but the military does not have the luxury to only select on those skills that are useful for a given country or region. Thus for this project to have any veridical implications, both sets of experts should be nominated to obtain the largest variance in cross-cultural adaptation experts.

2.2.1 IDEAL CROSS-CULTURAL ADAPTER CHARACTERISTICS

All participants, regardless of whether they nominate somebody or not, could complete a survey about the skills and traits they believe are necessary for cross-cultural adaptation expertise. This particular assessment was designed to elicit the knowledge, skills, and traits of the idealized cross-cultural adapter. Part 1 of the nominator survey included 11 questions scored along a 5-Point Likert Scale (Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree, and Strongly Agree) that addressed the nominee's experience with and aptitude for cross cultural adaptation. The second part of the survey was a derivation of the Multicultural Personality Questionnaire (MPQ-SF) (described in section 2.5) where the nominator was to indicate how the items apply to the nominee.

2.3 CULTURAL SENSEMAKING ABILITY

Sieck, Smith, & Rasmussen (2008) found that a critical differentiating feature between experts and novices in cross-cultural situations was the ability to engage in cultural sensemaking. This ability to index content, make attributions, and then select schema was identified as a key differentiator in determining current ability at cross-cultural adaptability. JHU/APL worked with Sieck and Rasmussen to develop a cultural sensemaking task.

In order to understand what is really occurring in a complicated cross-cultural environment, JHU/APL designed a scenario situation with various stages (Sieck, Smith, & Rasmussen, 2013) to test and analyze. The first stage was 'Notice the Anomaly,' and was designed to determine how early participants detected a misunderstanding was occurring. The next step was to inquire as to the causes of the unexpected event. It is generally accepted that experts at cross-cultural interactions tend to inquire more and identify a larger range of possible causes than do non-experts.

After inquiring as to the causes, experts tend to consider multiple alternative explanations for the cultural surprise. This often requires inhibiting prepotent, stereotypical responses to the event. Experts have to have the ability to suspend judgment until there is sufficient evidence to determine what caused the cultural surprise.

In the study, participants were required to read two vignettes where a cross-cultural misunderstanding occurs (see

Appendix B: Cultural Sensemaking Vignettes). JHU/APL ultimately selected two vignettes: (1) Breakfast at the Café (A.14) where a tourist returns to a café they had had breakfast in the day before, but the price was considerably different than it had been previously, and (2) Riding the Bus, a more military-focused vignette (A.20), where after a change in military action there was an unexpected, precipitous drop in children taking the bus to school.

After reading the vignettes, participants were asked a series of free-response questions. The first question was what they would do next. The second asked them to explain what happened in the situations. Participants were required to spend at least 3 minutes on each task, allowing them to spend time generating multiple kinds of explanations. After that, participants also spent 3 minutes generating questions about the situations.

After the free-response questions, a series of multiple-choice questions were asked of the participants. The first question was to identify which action would be the best response in that particular situation. The second was about which question they would most want answered. Finally, a multiple-choice question asked about the most likely explanation for the situations. This was followed by an assessment of the level of fixation of the participants on their explanations as assessed by having the participant rate the probability of their explanations being correct as well as the probability of each of the other potential possibilities.

In order to determine the best vignettes to use, a pilot study was run (after obtaining IRB and HRPO approval) on participants via Amazon Mechanical Turk. The cultural sensemaking task was never tested with a military population, as only the pilot study was completed. Thus no results were obtained about if performance on this task correlates with expertise in cross-cultural adaptation that will be of interest to the military population.

2.4   ASSESSING PERSONALITY TRAITS

Personality is the stable set of characteristics and tendencies that determine commonalities and differences in people's thoughts, feelings, and actions that have continuity over time and are not the proximal result of temporary social and/or biological pressures (McWilliams, 2004). Understanding an individual's personality provides insight as to how they attend to experience, modulate affect, view him or herself, uses ideation, manages stress, and interacts with others (McWilliams, 2004), and thus it is valuable to include a measure of personality in an experiment concerned with not only interaction with others, but also modulating affect. The Five-Factor Model (FFM), or Big Five, of personality consists of five macrolevel domains or dimensions; neuroticism, extroversion, openness, agreeableness, and conscientiousness (Costa & McCrae, 1992). The FFM is a widely used model of personality that, although not diagnostically sensitive enough for clinical use, has considerable research utility (McCrae & John, 1992). Neuroticism is characterized by emotional instability and a susceptibility to psychological distress (Costa & McCrae, 1992). Neuroticism negatively correlates with performance under stress, particularly when the stress is exceedingly high such as during combat (Grier, 2012). Neurotic individuals often appear anxious and/or moody and are generally less likely to be perceived as capable leaders (Johnson & Hill, 2009). Extroversion is an outward focus of one's psychological energy

as opposed to an inward focus on subjective experience or Introversion (Costa & McCrae, 1992). There is no consistent relationship between extraversion and performance under stress beyond the fact that extroverts tend to perform better with others around (Grier, 2012) and generally exhibit affiliate and/or sociable behavior (Johnson & Hill, 2009). Openness is the degree to which individuals seek "new Information," often manifesting in intellectual curiosity, creativity, and a general non-conformity (Costa & McCrae, 1992). Openness correlates highly with microlevel traits such as uncertainty and ambiguity tolerance (Johnson & Hill, 2009). Agreeableness is the tendency to be caring, cooperative, and tolerant (Costa & McCrae, 1992). Agreeable individuals tend to interact well with others, and thus tend to be viewed favorably as leaders whereas disagreeable individuals come across as rigid and/or oppositional (Johnson & Hill, 2009). Conscientiousness is the tendency to be industrious, organized, and responsible (Costa & McCrae, 1992). Conscientious individuals are generally dependable and achievement-oriented; attributes that tend to correlate with leadership ability (Johnson & Hill, 2009).

Among the limitations of macrolevel personality traits in predicting performance in military cohorts is the lack of specificity in the broad constructs (Grier, 2012) as well as the vast gamut of experience in modern military operations ranging from the mundane to the terrorizing (Parmak, Mylle, & Euwema, 2013). While there are combinations of personality traits associated with more effective leaders, elevated on Extroversion, Openness, Agreeableness, and Conscientious and a correspondingly low score on Neuroticism, (Johnson & Hill, 2009), there may be additional attributes that contribute to an individual's ability to interact with others from a different culture.

Given the motivation of the study, it was determined that a more applied measure would be preferable to a generalized personality assessment, and thus the short form Multicultural Personality Questionnaire (MPQ-SF) was selected. The MPQ–SF is a 40-item self-report measure that also uses a five-factor model (van der Zee, van Oudenhoven, Ponterotto, & Fietzer, 2013). The five factors in the model were cultural empathy, open-mindedness, emotional stability, social initiative and flexibility. Cultural empathy refers to empathizing with individuals of a different culture; open-mindedness refers specifically openness toward cultural differences; emotional stability is the ability to remain clam in the face of cultural uncertainty; social initiative refers to exercising initiative in cross-cultural social settings; and flexibility refers to interpreting novel cultural stimuli and adjusting positively (van der Zee et al., 2013).

2.5 REGULATORY CHALLENGES AND LESSONS LEARNED

JHU/APL faced many challenges and ultimately learned quite a few lessons over the course of this project. The first study was to be conducted using active-duty military as well as recently retired military personnel. The reason for this was to ensure that any results would actually be of utility for future military decisions regarding personnel who experience unique circumstances compared to others in having to adapt to random cultures.

In order to recruit active-duty personnel for the study, JHU/APL also had to navigate through additional regulatory procedures beyond Johns Hopkins University IRB approval. ONR graciously provided a liaison to help with the process.

Knowing that having active-duty military personnel participate in the study would be a significant challenge, the first study was designed to minimize physical and privacy risks for active-duty military. JHU/APL obtained local IRB approval in June, 2013. The ONR HRPO liaison estimated at that time it would take about two additional months to obtain HRPO approval; instead, it was not until 17 months later that it was decided this project would not be submitted to the HRPO for review.

During the interim, significant effort was spent modifying the experiment in order to obtain the necessary HRPO approval. JHU/APL worked with organizations such as CAOCL and the Marines Survey Officer searching for acceptable solutions to move the study forward. Despite those efforts, ONR opted not to submit this study to the HRPO for approval; therefore, no military-related results were obtained for this study.

There is still an urgent need to improve understanding of cross-cultural adaptation ability; particularly in the case of the military who regularly send personnel to interact with warlords, sheikhs, foreign military, foreign doctors, and countless others. JHU/APL could have focused their recruitment solely on recently retired military personnel (which would probably not have raised so many regulatory concerns) or college students (who are much more accessible a population), but then the results would have had less direct implications for military personnel. However, given the time and resources spent on attempting to obtain HRPO approval, future studies on this topic may be better served by not having active-duty military as participants.

2.6 DISCUSSION

Study 1 was designed to test extant hypotheses about what skills and traits make a person particularly adroit at cross-cultural interactions, especially in a culture-general manner. It was designed to test this hypothesis with active-duty military, the main population of interest, so that the results could immediately impact military selection and training. Unfortunately, no actual data was obtained in this study except for pilot data on cultural sensemaking (which was not collected on active-duty military, but only on Amazon Mechanical Turk population), due to ONR determining this project should not proceed to the human-subjects testing phases.

Until the military better understands the culture-general skills and traits indicative of better cross-cultural performance, the military is unable to train these skills or select for these traits. In the near-term, research into what skills and traits are most important will mostly be those extracted from interviews, but this does not lend itself to a clear way to test the findings of these various researchers. Hopefully, future studies will determine a way that can technically test some of these hypotheses while successfully obtaining the regulatory approvals needed for the results to be of utility to the military.

3 STUDY 2: FUNCTIONAL NEUROIMAGING STUDY

3.1 BACKGROUND, OBJECTIVES, AND SCOPE

Study 2 was designed to examine in depth those aspects of cross-cultural adaptation that would be difficult to measure via purely behavioral tests: moral emotion regulation and cross-cultural empathy. However, this study was planned to be completed after Study 1, allowing participants in Study 2 to be given the behavioral test administered in Study 1 to determine the traits and skills of participants in Study 2. Due to the Study 1 regulatory hurdles discussed above, this study was not completed and thus this section will be rather brief. The design and logic of Study 2, as well as some of the stimuli that were designed, will be discussed,

Study 2 was designed to focus on moral emotion regulation and cross-cultural empathy. Emotion regulation can be difficult to test via self-assessment for two main reasons: first, there can be a cultural norm preventing people from admitting their emotional response (a norm particularly common with military personnel); and second, many are not consciously aware of how they regulate emotions even though the method by which they do so can have critical effects in how they will react in particularly stressful environments. Fortunately, functional magnetic resonance imaging (fMRI) can determine different brain regions associated with different strategies of emotion regulation such as suppression or reappraisal.

Moral emotions are the subset of emotions that have a moral component to them such as disgust and anger. Military personnel, in particular, often have to deal with incredibly difficult people, such as warlords, who have a very different value system that can be particularly onerous to a Western value system. Yet these personnel have to overcome their emotions to work with these people to accomplish the mission. The ability to successfully do so thus seems likely to be needed for long-term mission success.

Cross-cultural empathy is needed for non-verbal communication. The ability to read the emotions of another person can greatly facilitate communication. However, this sort of ability can be particularly tricky across cultures. For example, there is a large body of research that has determined that people do not look as closely at the faces of people of other races, which is part of the reason that people of other races look more alike to some. Naturally this is a problem for effective cross-cultural communication and adapting to unfamiliar cultures.

Behavioral experiments can determine a person's reaction time and accuracy at doing some cross-cultural empathy tasks such as the cross-cultural Reading the Mind in the Eyes (RMES) task JHU/APL planned to conduct. RMES was developed to test how well an individual could attune to the mental state of another by exposing the individual to 25 photographs of the eye-region of the face and determining which of four words best describes the emotion the stimulus is expressing (Baron-Cohen et al., 2001). There is a limitation to this, though; for real-world military personnel, they often have to do this task in high-stress environments that are impossible to ethically simulate in a lab. It is thus possible that performance alone wouldn't translate well to

how a person would react in a high-stress environment. Instead, it could be that the method used to do the processing in the RMES task may better simulate how people would perform in an extremely high-stress environment. People can utilize two different processing systems to perform the same task. System 1 processing refers to fast, associate heuristics people often use to do tasks, and these heuristics are less susceptible to interference from stress or workload. System 2 processing refers to the slower, rule-based processes people often use when using more rational and logical tasks. People who do cross-cultural empathy via System 1 processing are more likely to perform better in high-stress real-world environments than those who utilize System 2 processing, even if they perform no better in lower-stress environments.

System 2 processing may be more accurate than System 1 in a lot of tasks, even if somewhat slower. Given the speed-accuracy tradeoff, it can be difficult to determine therefore if faster, less accurate performance is better, worse, or equal to slower, more accurate performance. Fortunately, different brain regions are associated with System 1 and System 2 processing, so it would have been possible to determine what type of processing a person was engaged in while doing the cross-cultural empathy task.

3.2   STIMULI DEVELOPMENT AND PROCEDURE

To measure cross-cultural empathy, JHU/APL was going to use a modified version of the RMES task. Specifically, each participant was going to see four sets of eyes: (1) those belonging to people of the same culture and race as them (either Caucasian or African-American eyes), (2) familiar-other (Caucasian if the participant was African-American, or African-American if the participant was Caucasian), (3) East Asian eyes (specifically Japanese eyes, but not Japanese-American), and (4) Arabic eyes. Participants would be shown the eyes and would have to choose the emotion that they felt was represented by the eyes. The general finding is that participants are better than they expect on eyes from their own culture and race, but perform worse on eyes from another race and another culture.

In preparation for producing the cross-cultural RMES task, JHU/APL: (1) collected established expression data sets covering a number of ethnicities (Table 2), across a variety of ethnicities (Adams et al., 2010; Alzeyara, Sakr, & Ziadee, 2012; Baron-Cohen & Wheelwright, 2001; Kaulard, Cunningham, Bülthoff, & Wallraven, 2012; Lucey et al., 2010), (2) began the processing to normalize the images for presentation under fMRI, (3) began developing a standardized vocabulary for target and distractor expression words and a strategy for properly assembling them for each presented image, and (4) began developing the code to execute the dual task.

Table 2 – Expression Data Sets and their Ethnicities

Expression set	Ethnicity	Gender	Color	Gaze direction
NimStim	African-American, Asian-American, Caucasian	Both	Color, Grayscale	Head on

Baron-Cohen	Caucasian	Both	Grayscale	Various
Adams	Asian	Both	Grayscale	Various
JAFFE	Japanese	Female	Grayscale	Head on
MSFDE	African-American	Both	Grayscale	Head on
PICS	Iranian	Female	Color	Head on
CK+	Asian, Caucasian	Both	Grayscale	Head on

Whereas these sets may capture the whole face or provide a series of frames showing the expression as it manifests, or are in color, JHU/APL prepared methods and cropped an equivalently sized and isoluminant eye region to the Baron-Cohen set, selected the most expressive frame from a series, and converted the images to grayscale. In addition, JHU/APL began to generate presentation sets balanced for gender and gaze direction.

Words describing emotions are presented at the corner of each image. One of the four is the target, the other three are distractors. The distractors must be selected with consideration to the valence and cluster of emotion of the target.

Figure 2 shows an example of RMES stimulus of Asian eyes from the Adams dataset. Participants see only the eyes and are forced to guess which of the four emotions apply to those eyes. In this example, participants who selected 'worried' would be correct.

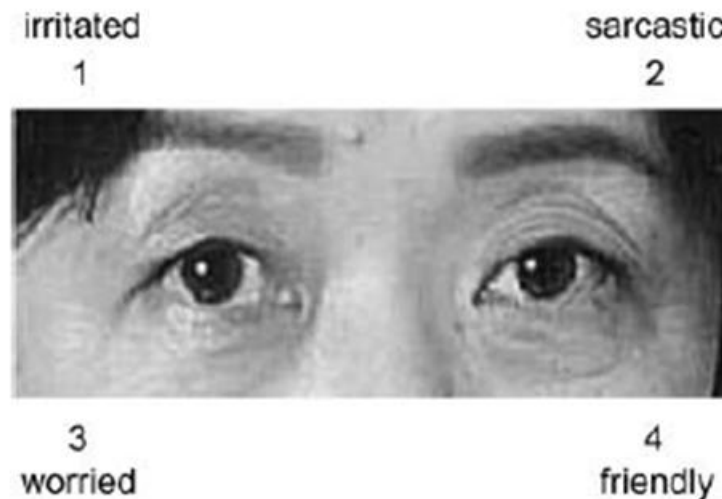**Figure 2: Example of RMES stimulus**

This experiment would also increase the participant's stress level by sometimes incorporating a high-workload N-back task (Figure 3). In an N-back task, a participant has to determine if a stimuli is the same as the stimuli that occurred N trials earlier, requiring a participant to continuously update their working memory (WM) and delete items from WM. Participants

would face blocks where they only had to do the RMES task, whereas other blocks where they saw the eyes but only had to say if the emotion in the eyes was the same as they saw N stimuli previously. A third type of block would merge these two into a high-workload dual-task where participants on each stimuli had to both determine the emotion of the eyes as well as determine if it was the same emotion they had selected N stimuli previously.
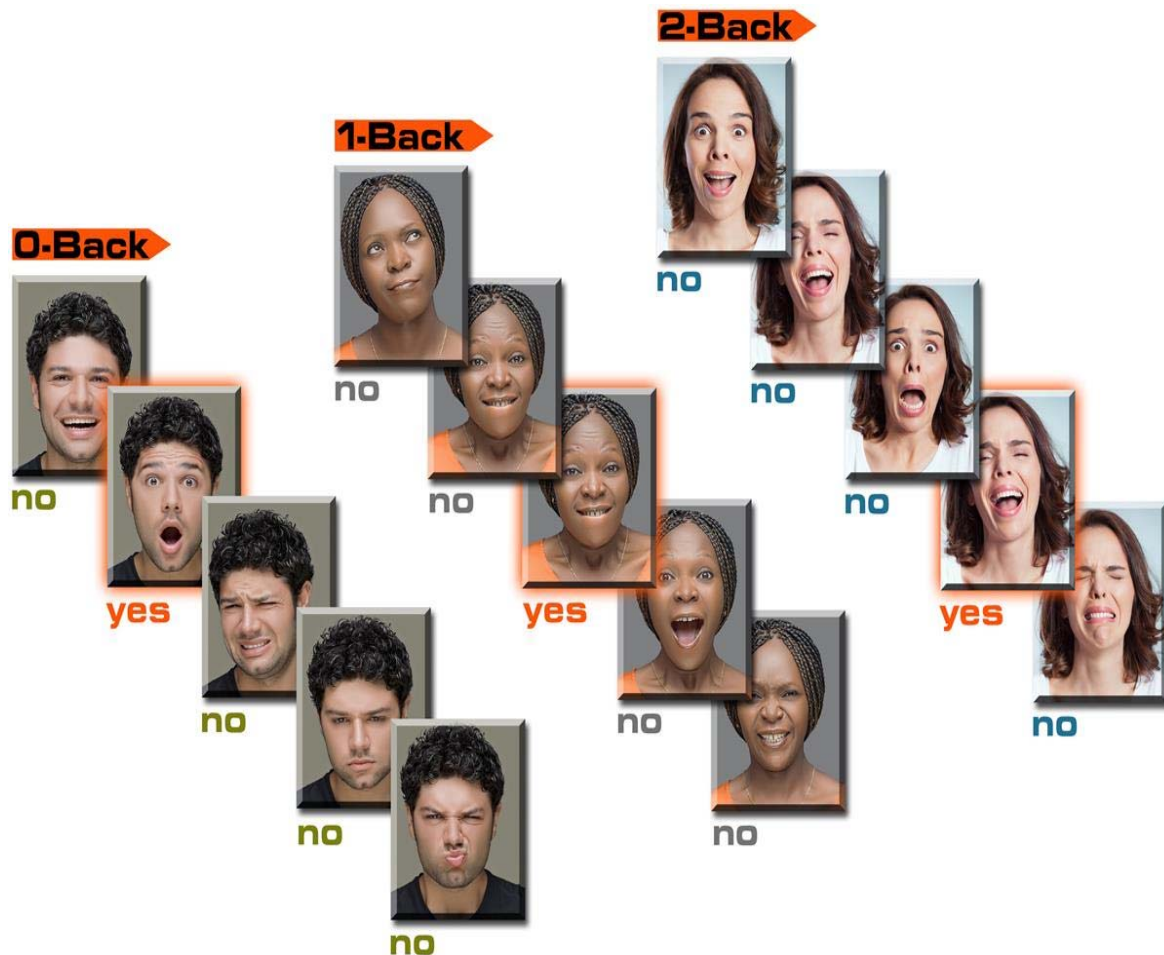
Figure 3: Example of N-Back Task. With 0-back the participant just identifies surprised faces. With 1-back, the participant has to determine if the emotion on the face was the same as the previous face. With 2-back, the participant determines if the emotion was the same as emotions two stimuli earlier. In the actual stimuli, only the eyes would be visible.

The moral emotion regulation task would have been based on Moll et al., (2011) where participants read short vignettes meant to trigger different moral emotions including guilt and disgust (see Figure 4). Some of the vignettes that were planned to be included were meant to have triggered a moral emotion in people from one culture but not from another. In collaboration with a Turkish collaborator, Aysecan Boduroglu, some vignettes were identified as likely to

trigger moral outrage in Western participants, but unlikely to do so with Turkish participants. These included vignettes about dowries and child-brides, common in many parts of the world but something that can trigger disgust in Western Participants. Note that these vignettes were not simplified to be ideal for fMRI studies, but they are still included in

Appendix C: Emotion Regulation . It was also planned to use some of the original vignettes used by Moll et al.
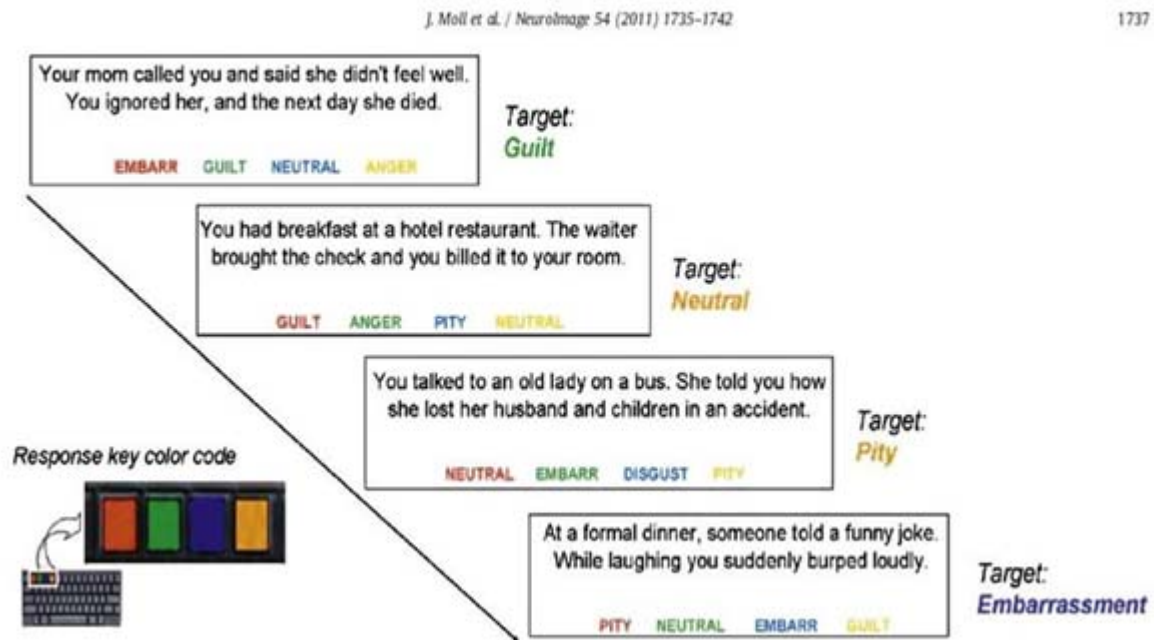
Figure 4 - Example of Moral Emotion Regulation Task, from J Moll, Oliverira-Souza, Bramati, & Grafman (2002)

The goal was to determine if experts were better at regulating moral emotions than non-experts. It was also hypothesized that experts engage in cognitive reappraisal strategies to regulate emotions, whereas non-experts were more likely to engage in emotion suppression strategies. Further, JHU/APL hypothesized that experts may experience less emotional arousal from these vignettes even if they were not told to regulate their emotions. By testing this, it could be discerned if experts were better at regulating emotions or were just less susceptible to emotional feelings in the first place.

3.3   DISCUSSION

Study 2 was designed to be an in-lab study letting JHU/APL study, in depth, certain moral emotion regulation and cross-cultural empathy. These two facets are important for cross-cultural adaptation, but would be difficult to study outside of the lab. The study was designed to be an fMRI study to better determine information that could not be elicited from the behavioral data only. Specifically, the design would have helped to determine whether participants were engaged in System 1 or System 2 processing when experiencing cross-cultural empathy tasks and what type of emotion regulation strategy participants engaged in during challenging situations.

Because Study 1 never obtained regulatory approval to conduct human-subjects testing, the JHU/APL team never finalized all the details of this study, as it was designed to follow Study 1.

4 STUDY 3: SPECIAL FORCES ASSESSMENT AND SELECTION

4.1 BACKGROUND, OBJECTIVE, AND SCOPE

Assessment and selection of elite military personnel remains an operational priority of the Special Operations community and an enduring research topic within operational psychology. One obvious difficulty is that different people will have different strengths and weaknesses, and in the absence of knowing what is likely to occur in the future, it is impossible to determine which particular strengths are most important. US Army Special Forces are well aware of this. Special Forces personnel are elite soldiers who are selected based not only on physical criterion but also personality attributes and cognitive abilities. Previous research has found that certain traits like grit and physical ability (Beal, 2010) were significant predictors of selection for Special Forces. As the world has changed, however, so has the criterion for which selection and assessment should occur. There is an interest by the Army to better understand their current selection and assessment process and continue working to improve that process.

JHU/APL worked with JFKSWCS to analyze historical SFAS data. This dataset included many physical and cognitive traits, many relevant for cross-cultural interactions, such as ability to learn foreign languages and foreign language testing ability. The goal of this study was to better understand the SFAS selection process. Are they overweighing certain variables and ignoring others that should be considered? Are there any ways to streamline the course to make it more efficient?

4.2 METHODS AND DATASET

The dataset was of all soldiers who attempted the SFAS course in FY2013 and FY2014, a sample size of 6,112. Of these soldiers, approximately 600 were injured during the course and were removed from subsequent analyses. Of the remaining 5,519 soldiers, roughly half passed the course and were selected to be in Special Forces (2,605 to be exact), with some of the non-selected voluntarily withdrawing, some involuntarily withdrawing, and some involuntarily withdrawn for failing physical tests during the early part of the course.

For each soldier, there were at most 42 different metrics collected (42 was the maximum possible, but almost all soldiers were missing some metrics). These metrics were then treated as variables in statistical models. These included variables such as their military occupational specialty (MOS), Ranger qualification, and Post from which they came. Other variables focused more on demographic characteristics including age, education level, and time in service. Various measures of cognitive ability were also included, including Intelligence Quotient (IQ scores,

including full-scale, performance, and verbal), General Technical (GT) score (a measure of crystallized intelligence tested as part of the Armed Services Vocational Aptitude Battery or ASVAB), Defense Language Aptitude Battery (DLAB) score, and some measures of reading and math ability. Numerous physical metrics were collected as well including push-ups, sit-ups, and pull-ups counts, run-time for a two-mile course, obstacle course performance, and rucksack performance times. Finally, there were a few variables that combined physical and cognitive performance. Star1 and star2 were land navigation tasks that required both physical and cognitive prowess to succeed. Table 3 includes the set of variables included in the subsequent analyses. Not included, but which would be worthwhile to do so in future research are social variables (Adaptability, Capability, Courage, Integrity, Perseverance, Personal Responsibility, Professionalism, and Team Player) evaluated by both peers and Cadre during team events toward the end of SFAS as well as psychometric variables (personality and cultural intelligence).

Table 3. SFAS Variables Included in Analysis

Variables	Explanation
Administrative Variables	
COMP	Active Duty or National Guard (Officer & Enlisted)
GRADE	Pay grade
MOS	Military Occupational Specialty
POST	Base to which they were assigned prior to SFAS
STATE	
Demographic Variables	
RGR	Ranger qualification (Y or N)
ED	Years of education
TIS	Time in service
Mental Variables	
READ	Tests of Adult Basic Education (TABE) Reading skills
MATH	TABE Math skills
LANG	TABE Language skills
GT	General Technical score (ASVAB)
DLAB	Defense Language Aptitude Battery
DLPT	Defense Language Proficiency Test
VIQ	Verbal IQ
PIQ	Performance IQ
FSIQ	Full Spectrum IQ
ST	Skilled Technical (alternative language score)
Physical Variables	
SWIM	Swim qualification (not required)
PU	Push-ups (raw)
SCORE	Push-ups score (converted)
SU	Sit-ups (raw)

SCORE	Sit-ups score (converted)
RUN	Run time
SCORE	Run score (converted)
TOTAL	Sum PU, SU, Run
RUN 1	*Timed run*
RUCK 1	Timed ruck
RUN 2	Timed run
RUCK 2	Timed ruck
SCORE	Score of timed events
O'COURSE	Obstacle course
PULL-UP	Pull-ups (raw)
Tactical Variables	
MAP TEST	Test of land navigation concepts
PE1	Practical exercise
PE2	Practical exercise
PE3	Practical exercise
PE4	Practical exercise
TOTAL	PE Total Score
STAR1	Graded land navigation exercise
STAR2	Graded land navigation exercise
TOTAL	Sum STAR1 & 2

An interesting aspect of this dataset is that the missing variables were often informative. A soldier who is missing lots of data likely is missing that data because they did not participant in the later stages of the course, meaning they have no chance of being selected. Thus, the analyses would have to allow for the fact that variables that were collected later in the course will only have data from the subset of soldiers who succeeded in the course up to that stage.

4.3   SELECTION ANALYSES

In order to control for the fact certain variables were missing, values for the missing variables were imputed in stages. In Stage 1, about 500 soldiers were removed from training. The first stage of imputation only imputed variables from these 500 soldiers that they would have done in Stage 2. Each variable was imputed sequentially, so for example Run 1 would be imputed from variables that were present in all 5,519 participants with Run being the most informative in imputing Run 1. Once Run 1 was imputed, then a new model would be fit to fit another variable, such as fsiq, in which case education may be most influential in imputing this variable. After imputing the variables missing in Stage 1, roughly 1,000 soldiers were cut in Stage 2. Once again, variables were imputed for these soldiers. The following variables were imputed at this stage: o.course, map.test, pe1, pe2, pe3, pe4, star1, and star2.

For all analyses where a model was tested, the data was first divided into training and test sets. The training set was used to train a model, and the test set was used to see performance of the model on data where it was not trained.

4.3.1 LOGISTIC REGRESSION MODELS

The first test conducted was a replication of Beal (2010), who used logistic regression to predict SFAS selection. Beal did not report all of his results, but he did report an adjusted R-squared of 0.42 from his logistic regression model. He found a five variable model worked best, using a 1st ruck march, TABE score, their ambition (as measured by a subscale from a test of grit), their years of education, and their Army Physical Fitness Test (APFT) score.

To replicate his findings, the variables were standardized via a Z-transform. Next, forward variable selection was used to determine which variables were most significant. This resulted in the following model:

```
## Call:
## glm(formula = wasselected ~ star1 + ruck.2 + star2 + fsiq + ruck.1 +
##    pu + dlab + rgr + pe1 + dist + o.course + lang + ed + map.test +
##    run.1 + pull.up, family = "binomial", data = train)
##
## Deviance Residuals:
##    Min    1Q  Median    3Q    Max
## -3.0564 -0.6465 -0.2447  0.7026  3.7611
##
## Coefficients:
##          Estimate Std. Error z value Pr(>|z|)
## (Intercept) 4.356e-01 5.696e-02  7.647 2.05e-14 ***
## star1     8.863e-01 5.896e-02 15.033 < 2e-16 ***
## ruck.2   -4.476e-01 7.750e-02 -5.776 7.66e-09 ***
## star2     7.788e-01 5.964e-02 13.058 < 2e-16 ***
## fsiq      3.281e-01 5.778e-02  5.678 1.37e-08 ***
## ruck.1   -4.356e-01 8.028e-02 -5.426 5.78e-08 ***
## pu       2.002e-01 5.190e-02  3.857 0.000115 ***
## dlab    -3.570e-01 9.832e-02 -3.631 0.000282 ***
## rgr     -5.921e-01 1.521e-01 -3.892 9.94e-05 ***
## pe1      1.364e-01 5.221e-02  2.613 0.008966 **
## dist    -5.692e-08 1.985e-08 -2.867 0.004137 **
## o.course  1.314e-01 5.398e-02  2.434 0.014923 *
## lang     2.483e-01 9.243e-02  2.686 0.007225 **
## ed      -1.124e-01 5.172e-02 -2.173 0.029814 *
## map.test  1.050e-01 5.585e-02  1.880 0.060069 .
## run.1    1.040e-01 5.432e-02  1.914 0.055592 .
## pull.up  8.941e-02 5.186e-02  1.724 0.084712 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
## (Dispersion parameter for binomial family taken to be 1)
##
##    Null deviance: 5118.7 on 3699 degrees of freedom
## Residual deviance: 3281.6 on 3683 degrees of freedom
## AIC: 3315.6
```

The Nagelkerke R-squared for this model was 0.52, greater than Beal's, but a very different model. The most significant predictor was star1, the land navigation task, followed by the second ruck sack test and then star2, the second land navigation task. Ultimately, this model used 18 variables. To make a more meaningful comparison with Beal's result, a logistic regression model was created with only the top five variables (star1, ruck.2, star2, PIQ, and ruck.1). The Nagelkerke R-squared for this model was 0.49, larger than from the model in Beal's paper.

A more important test, however, is how accurately this model predicts selection on a test dataset. Results are below. The table shows the actual results. The top row is all the cases where the model predicts an individual will not be selected, and the bottom row shows the cases where the model predicts an individual will be selected. When the model predicts the participant will not be selected, the model makes an erroneous prediction (a false negative) 192 times, where the soldier was actually selected despite the model's prediction. The model generates a false positive 170 times, where it predicts selection and the individual is not selected.

```
computeClassificationStats(tbl)

##    Actual
## Pred  0  1
##  0 745 192
##  1 170 712

## $Accuracy
## [1] 0.8009896
##
## $Precision
## [1] 0.8072562
##
## $Recall
## [1] 0.7876106
##
## $FScore
## [1] 0.7973124
```

The model is pretty accurate, with an accuracy rate of 80.1%. Also reported are precision, the number of correct predictions of selection over all predictions of selection, here 712/(170+712), and recall, the number of correct predictions of selection divided by all the actual cases of selection, here 712/(712+192). Finally, the harmonic mean of recall and precision, the F-score, is reported and it has a score of 79.7%.

4.3.2   RECURSIVE PARTITIONING AND REGRESSION TREE MODEL

A logistic regression model, although accurate, can be difficult to interpret. So other models were tested that ultimately performed even more accurately and were easier to interpret. One of these models used a recursive partitioning and regression tree (RPART), and resulted in the following model that only used two variables, star1 and star2, the two land-navigation tasks:
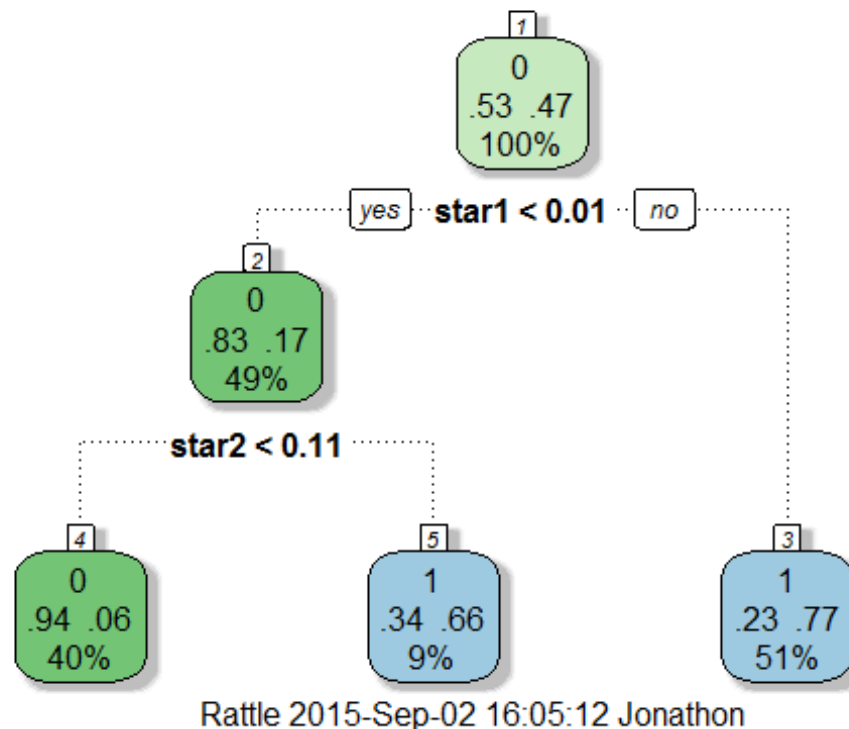
Figure 5: Tree to predict SFAS Outcome

To interpret this, the 0 or 1 in the top of each box is the prediction from the model. If the model predicts that all participants will not be selected (the 0), then the model will have an accuracy of 53%. However, if star1 for an individual is greater than 0.01 standard deviations above the mean, i.e. above-average, then the model predicts that individual will be selected (the 1) and the model will have an accuracy of 77% on those individuals who scored above-average on star1.

If the participant performed at average level or below on star1, then the model also utilizes performance at star2. If star2 was more than 0.11 standard deviations above the mean, then the model predicts the participant would be selected. Otherwise, the model predicts the participant would not be selected.

The performance of the model on the test set is below:

```
computeClassificationStats(tbl)
```

```
##    Actual
## Pred  0  1
##   0 638 54
##   1 278 849

## $Accuracy
## [1] 0.8174821
##
## $Precision
## [1] 0.7533274
##
## $Recall
## [1] 0.9401993
##
## $FScore
## [1] 0.8364532
```

With this model, it very rarely generates a false negative; only 54 times does it predict a person would not be selected who would have been. Compare this to 278 times where it makes a false positive prediction. This manifests itself with a very high recall of 94%, but a lower precision score of only 75%. However, the F-Score and the area-under-the-curve (Figure 6) both show the strong predictive power of this model.

Figure 6: AUC for RPART Tree

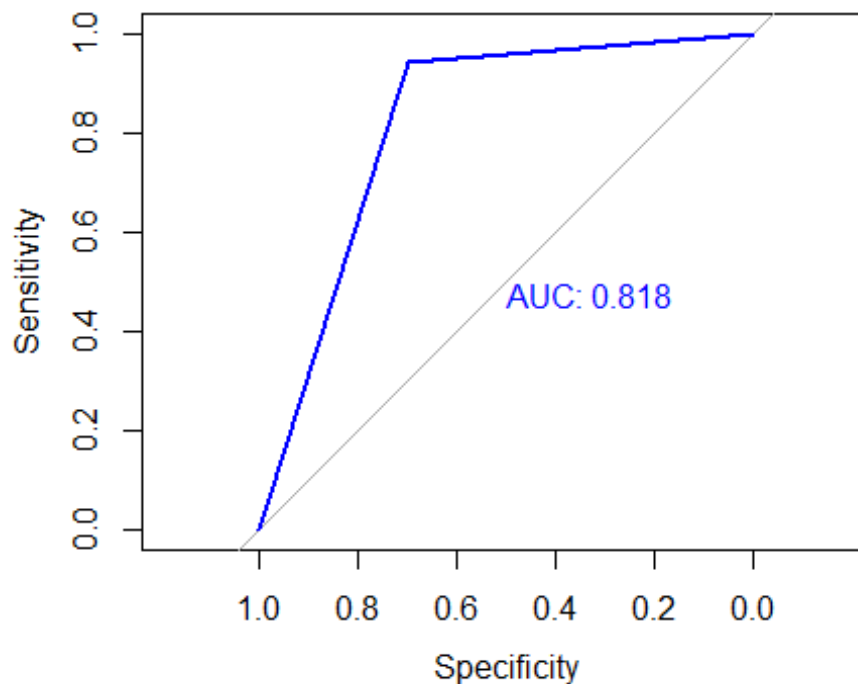This model, using only two variables, has higher accuracy and F-scores than the more complicated logistic regression using 18 variables. This indicates that just focusing performance on those two variables was sufficient to make meaningful predictions. In fact, this two-variable model outperforms logistic regression using all variables, which overfits in the training dataset so has an F-score of only 78.3% in the test dataset.

The false negatives and false positives from this analysis were often caused by people who got outstanding, or poor, reviews from their instructors and classmates, according to discussions with personnel at Fort Bragg and Camp Mackall. High performance on these tasks was not enough to overcome a reputation for causing trouble or not working well with the team.

4.3.3   RANDOM FOREST MODEL

A random forest model was also generated. In a random forest, only a subset of variables are used at any time for any given tree, and then numerous iterations are run to see which trees work best where different iterations often use only different subsets of variables. A random forest will always outperform an RPART, because it chooses the best trees amongst numerous iterations. The downside of a random forest is there can be no average tree, because each iteration contains different variables and thus are different. The random forest model was used to evaluate how well the RPART model performed compared to more complicated tree models.

The key results from the random forest model can be seen in Figure 7. With random forests, there are two main ways to measure the importance of the variables. The left plot of Figure 7 shows the variable importance plot, which measures how much worse the model performs when a variable is randomly permuted. The larger the mean decrease in accuracy, the more important that variable is to making accurate predictions. In this case, star1, ruck.2 and star2 all play a particularly integral role in accurate prediction of SFAS performance. Another metric, shown in the right plot, is to measure the importance via the Gini impurity index. Gini impurity is a measure of how variable or impure the final predicted classes in a model are. The more the data of the final predicted class only has members of that class, the lower the Gini impurity value. A larger decrease in Gini means that variable is more important in separating the predicted classes, i.e. without that variable there is worse separation of the final classes. In terms of decreasing Gini, star1 and star2 have considerably larger effects than do any of the other variables. Thus between the two plots, star1 and star2 are the only variables that seem to be important regardless of what metric is used. The fact that the second rucksack test goes from being one of the most important variables by one metric to a distant fourth indicates that it is not nearly as predictive as star1 and star2.
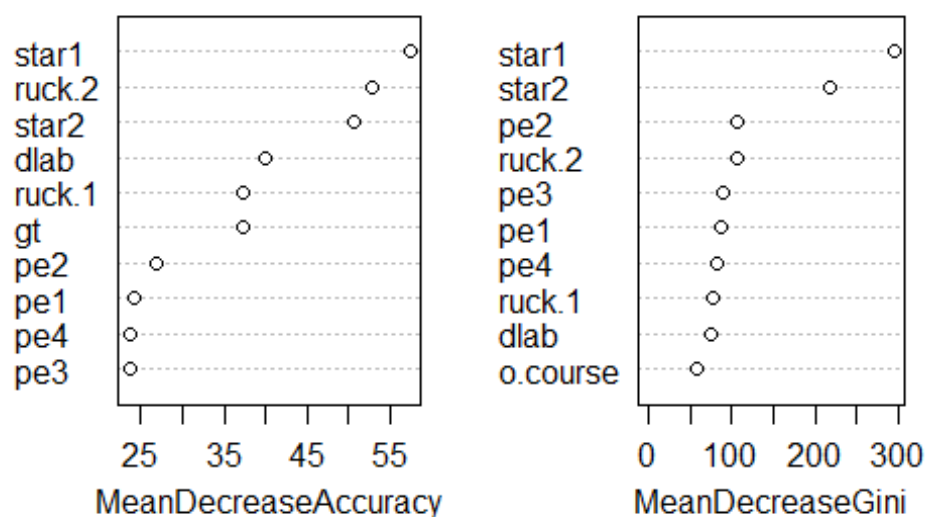
Figure 7: Random Forest Summary of results. Points more to the right indicate the model does not perform as well when that variable is removed, either via a decrease in accurate predictions or a decrease in how well separated the final predictions are. Star1 and star2 are the two variables that are most important across both of these measures.

The random forest model performance on the test dataset was:

```
computeClassificationStats(tbl.forest)

##    Actual
## Pred  0  1
##  0 688 88
##  1 228 815

## $Accuracy
## [1] 0.8262782
##
## $Precision
## [1] 0.7813998
##
## $Recall
## [1] 0.9025471
##
## $FScore
## [1] 0.8376156
```

Performance was better than the RPART model, but not significantly more so once the complexity of the model is considered. Accuracy with the random forest model was 82.6% compared to 81.7% with the RPART model, but the F-score for the random forest model was 83.76%, only slightly better than the 83.64% F-score from the RPART model. This indicates that the RPART model is quite a good fit and that no real need to add the complexity of a random forest.

4.4 ANALYZING SFAS ATTRIBUTES USING NORMALIZED MUTUAL INFORMATION (NMI)

The goals discussed below for analyzing the SFAS data set include: (1) understanding relationships between the data attributes, and in particular the correspondence between the candidates' characteristics (background and various test scores) and the selection outcome; (2) building a classifier to predict which candidates are likely to be selected.

4.4.1 BACKGROUND AND MOTIVATION FOR THE NMI APPROACH

The SFAS data consists of a mix of categorical and numerical variables. Categorical variables are those for which there is no natural arithmetic (such as sums, averages, etc.). Some of the categorical variables included in SFAS data are Comp, Grade, MOS, Post, State, Rgr, and Status. When a data set contains categorical variables, methods that measure dependency between numerical variables, such as correlation, cannot be applied.

An additional challenge in analyzing SFAS data is the relatively high number of variables; this is an instance of the "curse of dimensionality." The curse of dimensionality is the principle that, as the number of variables (or dimensions) increases, the observed data necessarily becomes sparse within the total space of possible value combinations. For instance, If there are just 10 categorical variables and each variable can assume only 4 possible values, the number of possible observed data values (i.e. value combinations) is 4^{10}, which is over 1 million. In most situations, including the SFAS data, the set of observed data is much smaller. Most value combinations are therefore never observed, and those that are observed are observed usually only once. The consequence of data sparsity is that it is difficult to derive informative probability distributions, and therefore also difficult to derive anomaly detection methods, classifiers, etc. which rely on probabilities.

Therefore, two significant challenges in analyzing the SFAS data are: (1) which metrics to apply, since correlation-type metrics for numerical data are unusable, and (2) how to overcome data sparsity.

The proposed approach developed at JHU/APL uses mutual information to characterize variable dependencies. The variable dependencies can then be used to derive a probability distribution for the data, and in turn the probability distribution can be used to build a classifier.

4.4.2   DEFINITION OF NMI

Normalized mutual information (NMI) measures dependency between pairs of categorical variables. Pairwise NMI values range between [0,1], where 0 means the variables are independent, and 1 indicates complete dependence. The NMI on variables X and Y is given by M(X,Y) in this definition:

$$M(X,Y) = \frac{I(X,Y)}{\min(H(X),H(Y))}$$

In the above formula, I(X,Y) is the mutual information (non-normalized), and H is variable entropy:

$$I(X,Y) = \sum_{x \in X} \sum_{y \in Y} p(x,y) \log\left(\frac{p(x,y)}{p(x)p(y)}\right)$$

$$H(X) = -\sum_{x \in X} p(x) \log(p(x))$$

4.4.3   BINNING NUMERICAL AND CATEGORICAL DATA

NMI must be applied to categorical data. This means that any numerical data (such as ages, various types of test scores, etc.) must first be binned. The original values can sometimes be used as the bins. For instance, in the SFAS data, consider the observed age values such as 21, 22, 23, etc. all as separate bins. However, when there are many distinct observed values, it is often better to simplify the values into coarser bins. The choice of binning is often informed by domain knowledge. For age, age ranges such as 20-24, 25-29, etc. tend to be used and obviously various binning schemes can be tried on each numerical attribute.

Even with categorical data, the data values are sometimes binned when the observed values appear over-specific. In the SFAS data, certain values were combined together when it made sense to do so. Details about that are in the sections below.

The takeaway for both categorical data and numerical data is that binning is important and affects the NMI results.

4.4.4   STEPS FOR ANALYZING NMI ON SFAS DATA

The following steps were used to compute initial NMI results on the SFAS data.

4.4.4.1 Filtering Records

Because there were so many categories, initial analyses focused on active-duty enlisted personnel, as they were of particular interest. Hence, before analyzing NMI, some of the data records were removed from the analysis:

- Officer records were eliminated (indicated by Comp values of AGO, NGO, or NG18X)
- Medical withdrawals were eliminated (indicated by a Status value of Medical Drop)
- In the binning process below, a small number of records were discarded due to data with unexpected formats or very odd values, likely typos.

4.4.4.2 Attributes and Binning

Thus far, the following attributes have been incorporated into the NMI analysis, with the binning and/or other data value modifications as indicated.

Table 4. SFAS Variables included in NMI Analysis

Attribute	Binning/Modifications	Notes
Status	Original value, no binning	
StatusBinned	Status of selected is labeled as "pass" and all other values are binned to a single value of "fail"	Simplifying the Status values to binary. This is the status description desired if the eventual goal is to create a selected vs. non-selected classifier.
StarMax	Contains the maximum value of star1 and star2 scores.	Used maximum rather than either the individual score or the sum of the scores, since some records have one of the scores missing. A missing value is not necessarily indicative of a "bad" candidate, and therefore it was not desirable to create a simple "missing" placeholder, or to assign a value of 0 to missing data.
GradeBinned	Grade is binned into categories of (1) E2 & E3, (2) E4 & E5, and (3) E6 and higher	Any other observed values caused the record to be omitted from the NMI computation.
State	Original value, no binning	
Post	Original value, no binning	
Comp	Original value, no binning.	
AgeBinned	Age is binned by 5 year increments: <20, 20-24, 25-29, etc.	As with any numerical data, alternate histogram bins could be tried here.
Rgr	Original value, no binning	
MosNum	The letter part of the MOS data	Binning method suggested from earlier

	value is dropped. For example, "14T" becomes "14".	discussion.
EdBinned	Education is binned as (1) high school, corresponding to values 12 and GED; (2) some college, from values 13-15; (3) college or grad school, from values 16 and higher; or (4) a missing value.	Alternative binning could be tried here, for instance by distinguishing college vs. grad school education levels.
RunMax	Equal to the maximum of the Run1 and Run2 scores, but no other binning.	Same reasoning as StarMax as to why maximum value is used. Binning could also be incorporated in the future to coarsen the score results.
RuckMax	Equal to the maximum of the Ruck1 and Ruck2 scores, but no other binning.	Same reasoning as StarMax as to why maximum value is used. Binning could also be incorporated in the future to coarsen the score results.

Using the attributes listed above, the NMI values are computed for all 78 pairwise combinations. The resulting NMI scores are shown in the graph in Figure 8. The NMI is recorded on each link, and note the thicker links correspond to higher NMI.

Some remarks about results:
- Since predicting outcomes of selected vs. non-selected (i.e. a two-class problem) is the ultimate goal of this analysis, the NMIs against the StatusBinned node are more relevant than those against Status.
- StarMax had a NMI of 0.48 with StatusBinned, which is a strong dependency, as expected.
- The RuckMax and RunMax scores also showed some dependency with Status, but the dependency decreased after Status was coarsened to StatusBinned.
  - Binning the numerical values on the Run/Ruck scores can be incorporated to see if the dependency with StatusBinned improves. As of now, these are raw Run/Ruck scores: with no binning being used on the resulting numerical scores. This omission was due only to time constraints in generating the initial results.
  - Note that RuckMax and RunMax are somewhat related to each other, as expected.
- The MOS and Grade attributes were not significantly related to Status or StatusBinned. This was somewhat unexpected, according to earlier discussions, as it was thought that those with a Special Forces MOS would be more likely to be selected in SFAS. It is possible that the binning schemes used in MOS and in Grade were suboptimal. Alternative binning can be tried on each of those attributes.

4.4.4.3 Additional Attributes

Other attributes such as maptest, the various IQ tests, and other test scores can be incorporated in the future. This is a somewhat slow process because test scores can be complicated to handle: there are many possible choices for binning schemes, as well as the confounding issue of how to deal with missing data. In general, missing data cannot be arbitrarily set to 0 or to a placeholder "missing" value without negatively impacting the NMI. Because of these complications, there is a need to incorporate attributes carefully and consider various binning schemes for each of them.
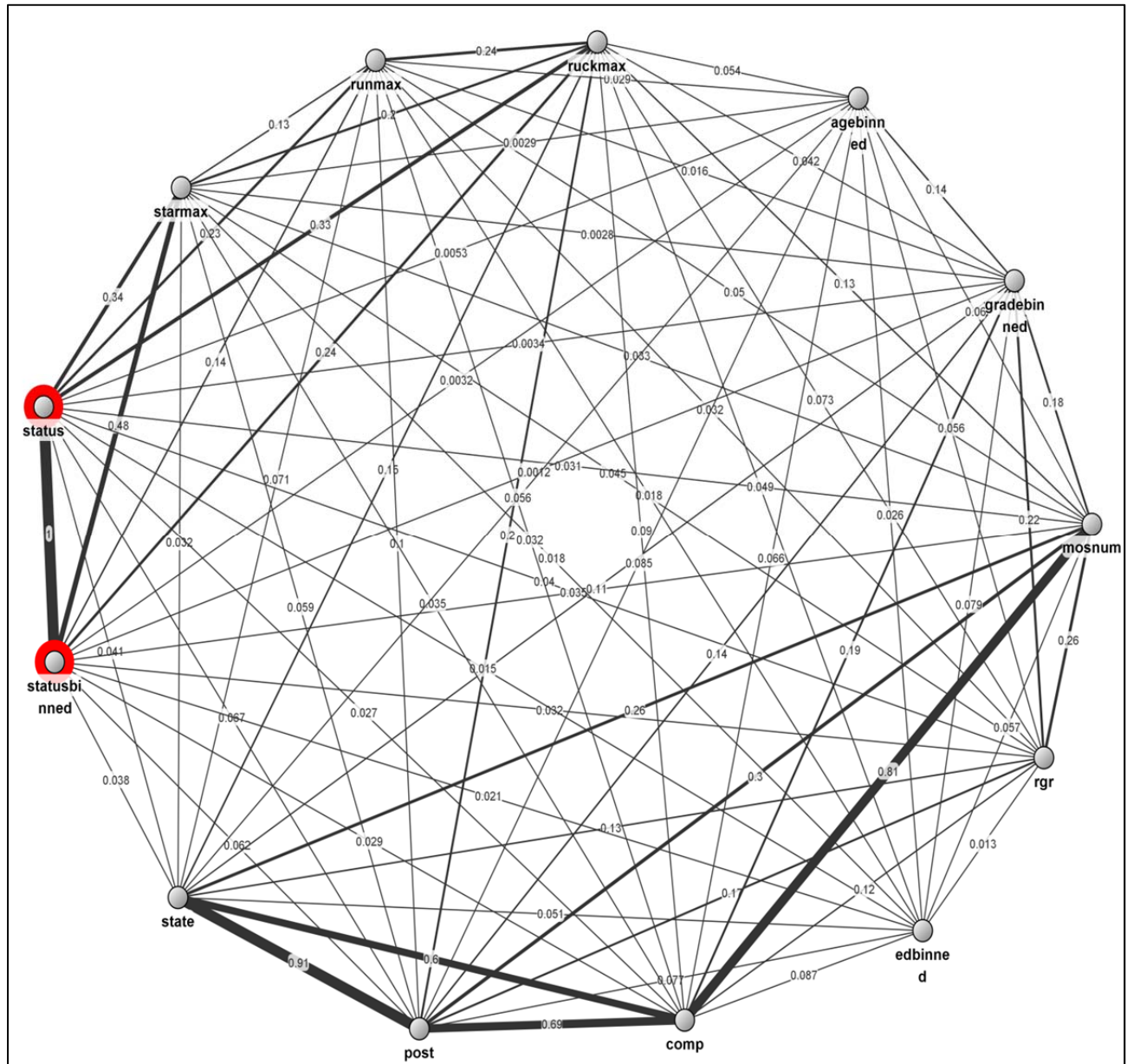
Figure 8. Normalized Mutual Information between all pairs of attributes contained the table. The pairwise NMI is indicated on each link. Thicker links correspond to higher NMI. The two status attributes are highlighted in red for emphasis.

4.4.4.4   NMI-Based Classification

The NMI results can be used to construct a classifier which predicts "Selected" vs. "Non-Selected" status from a useful subset of the non-Status attributes. The classifier has been applied successfully to other datasets, such as a publicly available mushroom data set. In that application, the classifier was used to predict poisonous vs. non-poisonous mushrooms, and performed well against test data.

Because of the binning issues and missing data issues which are still to be resolved, implementing a final classifier for the SFAS data is not achievable in the current period of performance. However, a few general principles can be noted here. The classifier will work better if (1) dependencies of the non-Status attributes with StatusBinned are high; (2) dependencies of the non-Status attributes *with each other* are low. Intuitively, this is because if the non-Status attributes are relatively independent, they each provide a useful piece of information towards predicting the StatusBinned outcome. By contrast, if these attributes are very mutually dependent (effectively, more redundant), then they each contribute less new information into the classifier. Therefore, it is ideal to bin attributes in a way that achieves NMI behavior described in (1) and (2).

4.5   DISCUSSION

SFAS selection was well-summarized by just the two land-navigation tasks, star1 and star2. Just from knowing performance on these two variables, it is possible to accurately predict selection 83% of the time. That just these two variables, representing one skill, are so determinative of selection has a few important implications that cannot be resolved as yet. One is that perhaps SFAS training time could be reduced if these tasks were moved to earlier in training. Unfortunately, the data itself cannot resolve this, because the fact that the land navigation occurs late in training may itself be important. Perhaps those who have passed the grueling tasks earlier in training and now have to go through the land navigation course and overcome their fatigue are those who should be selected. If the land navigation task occurred earlier in training, the soldiers would be fresher and thus have less need to overcome fatigue and the grind of the course to both plan and do a physical task while exhausted, which may make an early land navigation task less diagnostic of future performance. Second, it is possible that some of the tasks could be removed from training because they were not diagnostic of selection. Again, the data cannot unambiguously assert this. If overcoming fatigue is a critical part of the land navigation task, then earlier tasks that contributed to fatigue matter indirectly, even if they have no direct effect.

An even more critical caveat is that the goal of SFAS is to select those soldiers who will perform well not only in the SFQC but also in the Special Forces Regiment. Currently, the data on which soldiers perform best after the SFAS course completes is somewhat deficient. To rectify this in part, JHU/APL is working with 1st SWTG(A) to obtain SFQC data to determine how specific SFAS variables predict SFQC performance.

The ideal data, however, is performance data once the SF Sergeant or Officer graduates SFQC and joins the Special Forces Regiment. There is currently no clear objective measure of performance outside the Total Army Performance Emulation System, and that data is not available to researchers. If there was some measure of which SF perform better, than it would be possible to determine if SFAS was selecting the correct personnel or not. Absent that, it is possible to determine which tasks are most critical to selection as it is currently conducted, in order to make decision makers more informed that this is what determines the current outcomes, so they can decide if those tasks are what they consider most critical for future Special Forces operators.

5 CONCLUSION

Research designs to identify the underlying cognitive aspects (and their neural correlates) with high ecological validity of relevance for the military are underrepresented in the academic literature, and therefore research designs such as those proposed for the NC3A project are needed. There was, is, and will be a need to better understand some of the "soft" skills that military personnel need to succeed in across the range of military operations. Cross-cultural interactions are likely to be a key skill needed for success in the near-future, and it seems unlikely that military personnel will be able to determine which areas or cultures in particular will be the next flashpoint, given the number of potential flashpoints in the world. Despite the regional alignments of many major units in the Army and Marine Corps, the linguistic and cultural diversity within those areas of operation will necessitate culture-general skills.

The problem, of course, is "soft" skills are more nebulous and hard to objectively measure. This project was meant to help that along; although due to regulatory hurdles, no data that would shed light on this was produced. Human subject research is not without bureaucratic challenges but the benefit of persevering through such issues is external validity and operational utility. The pertinent psychological phenomena need to be studied in the personnel whom the issues are most likely to manifest and in the context in which they're most likely to operate. This simply cannot be accomplished using traditional undergraduate research participants (Henrich, Heine, & Norenzayan, 2010).

A component of this project did examine historical SFAS data from a group (US Army Special Forces), who are well aware of the need for cross-cultural adaptation and know that their operators need to improve in this regard. This project examined how SF makes this selection right now, and discovered that there was a clear focus on land navigation skills, and not much focus on cross-cultural skills that could be relevant for future success. The receptiveness of not only supporting human subjects research but also the idea of cross-cultural adaptability of JFKSWCS is promising and provides some degree of validation of the proposed designs described earlier. Unfortunately, the lack of empirical data to answer the aforementioned research questions limits where that conversation can go.

5.1   FUTURE DIRECTIONS

A positive result of ONR's decision not to proceed with HRPO approval was the opportunity to analyze historic SFAS data. The effort has been beneficial in ongoing internally-funded JHU/APL research to determine whether electroencephalography (EEG) and psychophysical (RT) responses during cognitive control tasks improve an SFAS prediction model. The logical succession is to obtain SFQC data to extend the prediction model and potentially incorporate neural correlates in said model.

Given the aforementioned receptiveness of JFKSWCS to JHU/APL research, rethinking Study 1 with an SF cohort may be tractable. Conceivably the snowball sampling discussed above in Study 1 could be incorporated with SF, where participants asked to nominate other SF soldiers they consider particularly able. The incorporation of training/evaluation observations from the SFQC Phase 1 cross cultural communication module may not only inform future task design but also provide an outcome measure for which the assessment described in Study 1 could serve as predictors.

The NC3A project was a missed opportunity for both ONR (to support) and JHU/APL (to execute) scientifically rigorous, operationally relevant psychological research. In general, there is still a need to have expertise classified so that skills and traits that separate expert performers from non-experts can be better discerned. Once those skills are known, the best-abled soldiers can be selected and trained, at least in theory.

Military psychology has historically bridged the gap between relevant psychological research and preparation of personnel ((Windle & Vallance, 1964) and should continue to do so. The human factors of warfare make psychological science particularly important to not only understanding the phenomena but also addressing the consequences. The social and behavioral sciences have much to contribute to military doctrine, organization, material, logistics, personnel, and facilities (or DOTMLPF) (Scales, 2009). From identifying the underlying relevant psychological phenomena through primary research to advising on how best to incorporate said research into policy (Kennedy, C. H., & Williams, 2011) or training individuals in ways that reflect said findings to improve tactical effectiveness (Murray, 2013), military psychology should play a prominent role provided it has the opportunity to do so.

APPENDIX A: ABBREVIATIONS

APFT	Army Physical Fitness Test
ARL	Army Research Lab
CAOCL	Center for Advanced Operational Culture Learning
CQS	Cultural Intelligence Scale
DLAB	Defense Language Aptitude Battery
DLPT	Defense Language Proficiency Test
DoD	Department of Defense
ED	Years of education
EIS	Emotional Intelligence Scale
ERQ	Emotion Regulation Questionnaire
fMRI	Functional Magnetic Resonance Imaging
FSIQ	Full Spectrum IQ
GT	General Technical score (ASVAB)
GT	General Technical Score
HRPO	Human Resources Protection Officer
IRB	Institutional Review Board
JFKSWCS	John F. Kennedy Special Warfare Center and School
MOS	Military Occupational Specialty
MPQ-40	Multicultural Questionnaire Short-Form
NC3A	Neural Correlates of Cross-Cultural Adaptation
NFC	Need for Cognition Scale
NMI	Normalized Mutual Information
ONR	Office of Naval Research
PIQ	Performance IQ
RF	Random Forest
RGR	Ranger qualification (Y or N)
RMES	Reading the Mind in the Eyes
RPART	Recursive Partitioning and Regression Tree
SF	Special Forces
SFAS	Special Forces Assessment and Selection
SFQC	Special Forces Qualification Course
TIS	Time in service
USMC	United States Marine Corps
VIQ	Verbal IQ
WM	Working Memory

APPENDIX B: CULTURAL SENSEMAKING VIGNETTES

The following are some of the vignettes prepared as part of the Cultural Sensemaking task:

DIALOGUES

A.1   **01CDP1: PERFORMANCE EVALUATION** *(STORTI32)*

Word Count: 140
Intro: You are assigned as the manager of a branch of a U.S. company in the Middle East. After 3 months you decide it's time to give performance evaluations to the local staff. Khalil is the first staff member on your list.

YOU:	Thanks for coming, Khalil. Let's go over this evaluation together, shall we.
KHALIL:	Whatever you'd like.
YOU:	As you know, you're quite strong in most areas. There are just a couple of areas where you could be stronger.
KHALIL:	I see.
YOU:	One is in writing, which isn't easy for you, is it?
KHALIL:	No.
YOU:	And the other is in identifying training needs. Some of your staff could use more computer training in particular.
KHALIL:	Yes.
YOU:	Anyway, it's all written here. You can read it. Otherwise, no serious problems.
KHALIL:	I'm very sorry to disappoint you.

A.2   **02CDP1: EXPLANATIONS** *(STORTI38)*

Word Count: 101
Intro: You are overseeing production at a U.S. textile company in China. One day, Miss Chung, a local seamstress comes to your office.

YOU:	Miss. Chung. What can I do for you?
MISS CHUNG:	Excuse me. I need some help with this new machine.
YOU:	Of course. Let me explain it again.
MISS CHUNG:	I asked Li, but she couldn't help me.
YOU:	No, she hasn't tried it yet.

MISS CHUNG:	It's a little bit complicated.
YOU:	It's very complicated, but after I explained it to you and asked you if you understood, you said yes.
MISS CHUNG:	Yes. Please excuse me.

A.3   03CDP1: WRITING A REPORT *(STORTI40)*

Word Count: 115

Intro: You are the manager for a branch of a U.S. technology firm in India. You have asked Ram, a local team leader to evaluate production at the company's five production facilities in India and to submit a report outlining the results.

YOU:	How is the evaluation going, Ram?
RAM:	It's finished. We can start on the report anytime now.
YOU:	Good. How long do you think it will take?
RAM:	Pardon?
YOU:	To write the report.
RAM:	I couldn't say.
YOU:	You don't know how long it will take?
RAM:	When would you like it?
YOU:	Well, I want to give you enough time to do a good job.
RAM:	We'll do a good job.

A.4   04CDP1: JUST TRYING TO HELP *(STORTI58)*

Word Count: 138

Intro: You work for a U.S. manufacturing company in the Middle East. A while back you asked Hassan, a local employee, if he knew anyone at the local customs office who might be able to look into a shipment of parts that had been held up there for some time.

YOU:	I saw the man in the Customs Office today.
HASSAN:	Oh good.
YOU:	He said you never spoke to him about releasing the shipment.
HASSAN:	I'm very sorry.
YOU:	In fact, he said he's never even heard of you.

HASSAN: It's possible.
YOU: But when I asked you if you knew him and could help, you said you would try.
HASSAN: Oh, yes.

YOU: But it wasn't true. You don't know him and you didn't talk to him.

HASSAN: Excuse me. But I was only trying to help.

A.5   **05CDP3: OPTIONS** *(STORTI19)*

Word Count: 142
Intro: Ms. Carrol, an American, is supporting a project team in a branch of a U.S. company in the Middle East. She meets regularly with Mrs. Rafik, the local branch manager to plan aspects of an important project.

MS. CARROLL: There are several ways we can do this.
MRS. RAFIK: Yes. I'm sure.
MS. CARROLL: If we seek donations, we'll probably get them. But that will take time.
MRS. RAFIK: You're right.

MS. CARROLL: If we spend our own money, we can start right away, but we'll have to go into debt.
MRS. RAFIK: Most probably.

MS. CARROLL: Or we could ask for an advance on our fourth-quarter profits.
MRS. RAFIK: That's possible too.

MS. CARROLL: So what do you think?
MRS. RAFIK: I think we should pick and get started.

MS. CARROLL: But we have to decide first.
MRS. RAFIK: Of course.

A.6   **06CDP3: DEDICATION** *(STORTI28)*

Word Count: 154
Intro: Ms. Lewis, an American, is the managing director of a recently acquired branch of a U.S. company in Italy. One day, she approaches Mrs. Fermi, the local human resource manager, to discuss Mr. Barzini, the branch's aging payroll manager.
MS. LEWIS: As you know, we've had many complaints about Mr. Barzini.
MRS. FERMI: What kind of complaints?

MS. LEWIS: He's very slow in his work and some of our people aren't getting paid promptly.

MRS. FERMI:	Yes. Mr. Barzini's been with us a great many years. His age is beginning to catch up with him.

MS. LEWIS:	So you agree?
MRS. FERMI:	Definitely. After so many years of dedicated service, we can't expect him to perform as he used to. We'll be hiring someone new.

MS. LEWIS:	That's good to know. How's he taking it?
MRS. FERMI:	Taking it?

MS. LEWIS:	Losing his job, I mean.
MRS. FERMI:	Oh, he's not losing his job.

A.7   07CDP3: A HELPING HAND *(STORTI34)*

Word Count: 124
Intro: Carl, an American, is a supervisor at a U.S. manufacturing plant in Mexico. One day he observes an interaction between Juan, a local crew manager, and one of the line workers, Raul.

CARL:	Hey, Juan. Is everything OK?
JUAN:	Yes, sir. I was just explaining to Raul here about the new drill press. Some of the men aren't sure about it yet.

CARL:	I know. Actually, I overheard you; what you were telling Raul isn't exactly right.

JUAN:	No?

CARL:	No. You have to turn the fan *before* you switch on the water jet, not after. Now try it, Raul. [Pause]. Yes. That's it. Any more problems with this, Juan, just come and ask me. That's what I'm here for.

JUAN:	Thank you, sir.

A.8   08CDP3: TWO NEW NURSING STATIONS *(STORTI44)*

Word Count: 121
Intro: Mr. Compton, an American, works for a Non-Government Organization. He travels all over the Middle East advising hospital managers, like Mr. Khouri, on how to administer donation funds.

MR. KHOURI:	Would you like to see the two new nursing stations?
MR. COMPTON:	Stations? I thought we agreed to build one station and, if there was any money left over, to buy some equipment for it so we could start using it.

MR. KHOURI: Yes, but there was enough money to build two stations at once.

MR. COMPTON: But is there any money left over to equip them?

MR. KHOURI: Unfortunately, no.

MR. COMPTON: Then we can't use them!
MR. KHOURI: Not presently. But isn't it good? We used all the money.

CIVILIAN VIGNETTES

A.9   09CV1P: FOREIGN BUREAUCRACY *(CUSH7)*

Word count: 94
You have recently arrived in a Middle Eastern country and obtained a position as a private English teacher.
You are required to obtain a work permit, and so present yourself at the appropriate government office to apply.
You are told to fill out a form and return in a few days.
You return to ask if the permit has been granted and are told the officer in charge has not had a chance to sign your permit.
You are asked to return in a few days.
On two more visits you meet the same response.

A.10   10CVP1: THE WELCOMED VISITOR *(CUSH21)*

Word count: 159
It takes some time getting used to—the transition to living on a small Pacific island is not easy.
You are the only American the locals have had any experience with. Except for the occasional tour boat that drops eager spenders ashore for a few hours at a time.
At first, everything seems special. Wherever you go, people rush about making certain you are comfortable.
The best welcome mats are put out when you come near, the best food is made available to you, and everyone seems to clean their homes whenever you are expected.
The villagers seem so attuned to your needs that you are usually the only one given a chair to sit upon.
After six months things are different. You are not showered with the attention to which you have grown accustomed. People seem almost indifferent toward you, as if you are hardly there.

A.11   11CVP1: USING THE LOCAL LANGUAGE *(CUSH33)*

Word count: 171
1st Person: Yes
You have been assigned to a prospective Asian area (in a country undergoing technological development) to do a field site study of the region. Excited at the prospect of doing well on your first foreign project, you bone up on the language of the area.

You studied the language in college and did very well. After you arrive in the country, you begin immediately to talk to some of the local people to get a better idea of the area.

Although you use mostly the host language, you notice that the people will usually giggle and then answer you in English even if they only know a little.

You continue talking to various individuals about different aspects of the society.

Often when you are trying to explain a relatively complex or intricate aspect of your interest, the people, in a smiling manner, encourage you to use English.

Even when you are confident that what you are saying is correct, people laugh, grin, nod their heads and then encourage you to continue.

A.12   12CVP1: BUSINESS OR PLEASURE *(CUSH61)*

Word count: 236
As the top salesman in your Midwestern U.S. area you are asked to head up a presentation of your office equipment firm to a Latin American company. You have set up an appointment for the day you arrive, and even begin explaining some of your objectives to the marketing representative who was sent to meet your plane.

However, it seems that the representative keeps changing the subject; he persists in asking a lot of personal questions about you, your family, and your interests.

You are later informed that the meeting has been arranged for several days later, and your hosts hope that you will be able to relax a little first and recover from your journey, perhaps see some sights and enjoy the country's hospitality.

You respond by saying that you are quite fit and prepared to give a presentation today, if possible. The representative seems a little taken aback at this, but says he will discuss it with his superiors.

Eventually they agree to meet with you, but at the subsequent meeting, after a bit of chat and some preliminaries, they suggest that as you might be tired they can continue the next day after you have had some time to recover.

During the next few days, you notice that though they had said they wanted to discuss details of your presentation, they seem to spend an inordinate amount of time on inconsequential activities.

A.13   13CVP3: THE UNSUCCESSFUL DINNER PARTY *(CUSH2)*

Word count: 258
Having been treated to a wonderful time by Mei-ying's family on her first visit to the Orient, Alice, an American exchange student, wants to return their hospitality. She invites them out for a

meal, but they politely refuse, knowing that her travel budget cannot afford it. Being aware of the Chinese emphasis on food, Alice volunteers to make the family a genuine American meal. They agree to this, saying that they will get whatever she needs. Alice makes a list, and Mei-ying takes her to the marketplace.

There seems to be a horde of people pushing and grabbing at the various items displayed in every available spot, right there in the street. Mei-ying attempts to maneuver Alice to the meat section, where she can get some steaks. As she nears the area, Alice spots a man who is scaling and cleaning out a large fish in the gutter. At this, Alice remarks on the unsanitary conditions of the place.

She nonetheless makes her way to the booth with the meat. Here she is met with the blank stare of a dead steer's head. Repulsed at this, she queasily asks Mei-ying to take her to another market, preferably one that is indoors.

Mei-ying hesitantly agrees saying that there is a Western-style supermarket on the next block but that she rarely goes there.

To her delight, Alice finds all the items she needs. However she notices Mei-ying poking and pinching and squeezing the items.

When all was prepared and served, Alice noticed that Mei-ying's family just picked at the food.

A.14   14CVP3: BREAKFAST AT THE CAFÉ *(CUSH57)*

Word count: 100
David and his wife Joanne are on a trip to southern Europe.
They have just arrived in Spain and on their first day they discover a little café near their hotel with friendly service and good coffee.
The next morning, they return to the café for breakfast.
They sit outside in the warm morning sun and enjoy an excellent breakfast of coffee and croissants.
However, when they are presented with the bill, David notices that it is almost double what they paid the day before for exactly the same items.
Angrily, he calls the waiter over and accuses him of overcharging.

A.15   15CVP3: THE SHINTO PRIEST *(CUSH68)*

Word count: 168
The U.S. branch of a Japanese manufacturing company in Japan has been operating successfully for some years, but in recent months a series of seemingly unrelated incidents have caused concern.
First, there is a rash of accidents in the plant itself, then one of the Japanese executive's children dies of a rare illness and another executive's car catches fire, severely burning him.
Rumors of a jinx on the company begins to spread among the employees, and morale lowers.
Consequently, the management calls a meeting of the executives to decide how to react to the situation. The American managers suggest that all safety and quality control procedures be reviewed so as to reassure the workers that their welfare is taken seriously.

The Japanese managers, however, hold that this has already been done; they feel that other forces are at work.

They wish to bring in a Shinto priest to bless the company and protect it against evil spirits—this is the only course of action that will reassure them.

A.16   16CVP3: LEARNING THE ROPES *(CUSH71)*

Word count: 145
1st Person: Yes
Helen Conner, an American, has been working in a Japanese company involved in marketing cameras for 2 years and is well respected by her colleagues.

In fact, she is so respected that she often is asked to work with new employees of the firm as these younger employees learn the ropes.

Recently, one young employee, Hideo Tanaka, was assigned to develop a marketing scheme for a new model of camera.

He has worked quite hard on it, but the scheme is not accepted by his superiors because of industry wide economic conditions.

Helen and Hideo happen to be working at desks near each other when company executives transmit the news of the scheme's nonacceptance. Hideo says very little at that point.

That evening, however, Helen and Hideo happen to be at the same bar. Hideo has been drinking, and he vigorously criticizes his superiors at work.

MILITARY VIGNETTES

A.17   17MVP1: THIS MAN IS A JERK! *(MIL3)*

Word count: 208
You are a Marine Corps Lieutenant Colonel deployed to Afghanistan to serve as an advisor to the Commander of an Afghan National Army unit. After a few days in Kabul you are transported to the Kandak where the Afghan unit is stationed. Here you meet the commander of the Afghan Battalion for the first time.

After brief introductions, the Afghan commander shows you to a large room where you will meet the rest of the Afghan battalion leadership and staff. This introductory meeting officially marks the replacement of the Army National Guard team who had been working with the unit prior.

In the room are a dozen officers of the battalion scattered about, all Afghans, some sitting and some standing.

One at a time they each greet you, make a few comments and praise Allah. Your interpreter is making sure you are apprised of everything that is said, whispering his comments into your ear.

It gets to this one Afghan officer who has not yet been introduced. Your interpreter whispers to you that this is the unit's religious officer.

The religious officer stands up and like the others first says, "Praise be to Allah…" and then he points his finger at you and exclaims, "You are a jerk."

A.18   18MVP1: THE COLA BOTTLE *(MIL10)*

Word count: 248

You are a Marine Corps Major serving as company commander in Somalia. On one of your first ventures outside of the base you meet the leaders of a local village who have never engaged with the U.S. military before. You can tell that the meeting is a big deal for the local leadership as they all appear to have donned their best clothes.

One of the village elders is particularly eager to show you around in the little town, his little village. You quickly agree and before you set out the elder grabs a Cola out of a cooler and hands it to you. You notice that the Cola is cold; the little cooler has ice in it.

The two of you walk through the village and after a little while you arrive at a makeshift medical clinic that has recently been stood up by a non-government group. Beaming with pride the elder shows you around the group of tents that make up the clinic.

All of a sudden the elder sees that you are standing there with your Cola unopened. He quickly grabs the Cola and reaches into a medical bin full of medical equipment.

You watch this unfold quickly, but immediately notice the bloody gauze in the bin and recognize that the equipment in it has been used for medical procedures.

The elder selects an instrument from the bin, shakes it off and uses it to open the bottle. He then hands the Cola to you.

A.19   19MVP1: THE MULLAH *(MIL25)*

Word count: 215

You are an Army Captain leading a US-Afghan team that is conducting a poppy clearing operation in the Tagab valley. As part of the operation you provide humanitarian assistance to villages along the way.

A Mullah has been working with the Americans on the team, and he has been very helpful. He goes in to the villages and talks about the poppy clearing, and all the things the team will do to help the villagers.

For the humanitarian assistance, the team will talk to locals, talk to elders, and distribute rice, oil, school kits for kids, soccer balls, prayer mats, and other items. They have scheduled a number of these events during the road building, and it has been going very well.

At the end of the road building operation, the U.S. team and Afghan partnered forces are packing everything up. Your Afghan interpreter comes up and says "Hey sir, there's a lot of stuff left over." "Really?" you say. "They said they distributed it all."

The interpreter says "Yeah, they kept some; they're hiding it in that truck."

The Afghan leader there at that time is the Mullah. You go to him and say "I understand we have supplies left over." The Mullah replies "No, no we don't have supplies. They're all distributed."

A.20   20MVP1: RIDING THE BUS *(MILW1)*

Word count: 286

You have just been assigned as the IO officer for an area in Kosovo. The overall mission is to maintain security. In this area, the Serbs, a protected minority in Kosovo, live in enclaves and are afraid to leave these.

In an outbrief, the previous officer provided information on a Serb bus situation in your area. Two years before your arrival, a bomb blew up a bus, and killed 17 students. Therefore, the U.S. has been escorting Serb college students to school placing an armored vehicle in the lead and in trail of their bus. About 60-80 students use this bus every day.

But, it is very expensive to provide the full escorts and a decision is to increase their efficiency while maintaining security. First, the two armored vehicles will be reduced to 1 for a period, and then down to zero but with a guard on the bus.

The thinking is that a demonstration of additional UAV air surveillance and security, along with the motivation of the students to finish the term, will carry them through. Some drop in ridership is expected, though it is assumed over time the levels will go back up.

The planned changes are described to the students and they are shown videos from the UAVs presenting aerial views. The students are told to wave at the UAVs so they can see themselves on the monitors to demonstrate the quality of the surveillance.

About two weeks after the announcement, the 2 escorts are reduced to one. The ridership drops to 50-60 students/day. After two weeks, the remaining escort is removed and a lightly armed guard is placed on the bus. The number of riders drops down to 10 students a day.

A.21 21MVP3: ANOTHER SEAT ON THE HELICOPTER *(MIL11)*

Word count: 269

U.S. Marine Corps Major Franks is deployed to Afghanistan with a civil affairs group attached to a provincial reconstruction team. Franks often accompanies the Provincial Governor and his staff on visits to Shurras and meetings in towns and villages all over the district.

To get to these meetings the travel party always makes use of a U.S. Army helicopter that has been made available to the local Afghan leadership. This helicopter, however, has a limited number of seats; a little more than 20.

The first time the Provincial Governor and his party arrive at the airfield it becomes clear that not everyone will fit. Franks informs the Governor's head security officer of the problem, "You have 20 seats to give out to people. You choose." When it comes time to get on the helicopter, Franks stands by the side of the helicopter along with the Afghan security officer and counts.

They get to a point where the police chief, who is a Colonel, and his two body guards are still waiting to board and there is only room for one more. The governor and his body guards are already seated in the helicopter. "It looks like there will only be room for you today, sir?" Franks says.

"I want my two body guards to go also," the police chief retorts. Franks is firm, "no, you can't bring them. We don't have room for them." The two argue back and forth for a while before the police chief, although visibly upset, complies.

Six weeks later the exact same thing happens. In fact, this repeats every time the Provincial Governor travels.

A.22   22MVP3: BITTER ALMONDS *(MIL17)*

Word count: 276

U.S. Army Staff Sergeant Waterman is deployed as a human intelligence collector in Afghanistan. One of the local leaders that Waterman is assigned to meet with on a regular basis is named Wahidi. Waterman is eager to develop a relationship with Wahidi so he takes care to make sure that that tea, dried fruit, and nuts are available whenever they meet to help break the ice. Waterman himself is particularly fond of the Afghan spiced almonds.

Even so, developing a relationship is slow going. Over the course of their meetings Waterman tells Wahidi about his background, his family and hometown. In their third meeting Waterman says, "Let me learn something about you."

Wahidi replies, "Well, what do you want to learn about me? I'm Afghan and I've been in this country all my life, I don't know anything else."

Waterman is not disheartened, "Well, tell me about your history and the war with the Russians." Wahidi shakes his head and says, "You know. I have a question to ask you but I don't want you to be offended." Waterman is intrigued, "You can ask me anything" he says. Wahidi continues, "Why do you always have the almonds in front of you?"

Waterman looks at the bowl in front of him. "I don't know," he says. Wahidi cocks his head, "Do you know what almonds are considered in Afghanistan?" Waterman is mystified, "No." "We call them brain food, food for the brain."

"Okay," Waterman replies slowly. "Every time I meet you're the only one eating the almonds. And so I'm thinking you're trying to be smarter than I am because you never offer me any," Wahidi explains.

A.23   23MVP3: IS THAT A "NO"? *(MIL19)*

Word count: 238

Tensions within a large country in the Middle East have been on the rise. The international community and U.S. leadership are worried that the brewing conflicts between warring factions within the country might soon lead to an all-out civil war. U.S. Marine Corps General VanLehn accompanies prominent U.S. State representative, Mr. McDonald, on official visits to leaders in in the Middle Eastern states surrounding the country in question. The purpose of the visits is to ask permission to use their military bases as staging grounds in preparation for the possibility that the situation escalates.

In Saudi Arabia VanLehn and McDonald meet with Chief of the Armed Forces of Saudi Arabia. The meeting goes well. The three of them along with a few of the official's staff and an appointed interpreter have tea. They discuss history as well as current political events.

The Saudi military chief seems to share their concerns about the stability of the situation in the neighboring country.

When towards the end of the meeting McDonald asks the chief about opening up his military bases to the U.S. and international community the chief changes the subject.

After they formally conclude the meeting the chief follows them to the door. As they walk out he puts his hand on VanLehn's shoulder and says, "Remember, in the end we're always your friends."

When they drive back to their hotel, McDonald says, "I guess we can't use their bases."

A.24 **24MVP3: THE VILLAGERS** *(MIL23)*

Word count: 261

U.S. Army Captain Lang is leading a humanitarian assistance operation in a village south of Kabul. It is a joint operation between Lang's team and an Afghan National Army unit. The team drives to the village to deliver clothing supplies and blankets.

Someone has informed the local Police Chief of the operation, and the Police Chief provides an escort of four or five cars. As the team arrives, it seems as though the entire village comes running up to them.

The team is not even set up yet, and people are crowding around, pushing each other, grabbing for the clothing and blankets. Lang notices that the clothes people are wearing are clean and in good condition, so he thinks they are probably not the most poor.

The team starts noticing that they have given items to the same people from the village two or three times. The same villagers come up wearing different hats or clothes, and each time they take as much as they can possibly carry.

This leads to a shortage of supplies, and the villagers that are slower getting there do not get anything. The team then has to stop people from fighting each other for the items. Even people who have arrived together in the same vehicle fight each other for supplies.

The team also realizes that even some of the local police who are part of the escort are lining up to receive items. They have changed out of their uniforms, put on civilian clothes, and joined the crowd of villagers around the distribution truck.

APPENDIX C: EMOTION REGULATION VIGNETTES, LONG-FORM

1) Dowry money & Child-brides (the dowry money and child-bride can be separated; technically in many rural parts there is still dowry money even for somewhat more "normal" marriages).
The elders of two families come to an agreement regarding a particular marriage. A teenage girl (even as early as 12) is married off to an older man (could either be around late 20s, late 30s or much older in their 50s, 60s-in the latter case, as a second wife). In return the guy's family pays the girl's family. The dowry can be in terms of cash ($ even better!), sheep etc.)

2) Different types of Marriage
Another kind of marriage is that in the case of death of a brother, where the widowed sister-in law is wed with a single or widower brother-in law (Levirat). This is done in order to keep the inheritance of the deceased in the family and for the children's welfare. Similarly, it is also possible that a sister gets married to a deceased sister's husband (Sororat).

In the past, particularly in rural areas, men would "snatch" or kidnap a girl that they wanted to marry, but were not allowed to for one reason or the other, mostly due to objection by families. It also happened that a girl and boy run away in mutual agreement to overcome family objection to their matrimony. In some regions, there is also a type of "snatching" called "oturakalma", where a girl goes to the home of the man that she loves and settles there, many times at the objection of her own family. -- THIS IS RATHER COMMON

Another type of marriage which was often practiced in the past is "beşik kertme". While children were yet in their cradle, they were promised or "engaged" to each other by their families. In the past, the rejection of marriage by the girl or boy once they reach marrying age, would be regarded as dishonor to the family and even could cause bloody family feuds. This type of arranged marriage is almost extinct today.

3) Having kids
Two sisters. Both married. One of them cannot have kids for whatever reason. When the sibling has a child, her kid may be registered under the other sister. Either /Both parties may be involved in the bringing up of the kid. (Probably less common nowadays, but more so 2 generations up).

4) Prayer time:
Men go to the mosque right before prayer time, and at the mosque, there are fountains (outside!). Men sit there and take off their shoes, socks etc. and wash up in public prior to namaz (ablution)

5) Prayer time-
Friday noon prayers are special in Islam-some believers would argue that if you miss a few of these you would end up in Hell. Also, it is required that you pray as a group in a mosque

(cemaat). This results in people putting up their prayer mats in streets when they cannot find room in the courtyard in the mosque. This can 1) block traffic - but you cannot say anything-- 2) social pressure to the shop-owners to close their shops because people (especially women) are not supposed to walk by the men when the men are praying.

6) Being affectionate in public & beating.
A couple sits hands in hand on the bus, and then the bus driver stops the bus, basically beats them off the bus, saying "This is not a place for sex". Another passenger saying that the couple was not disruptive was then also forced to get off the bus.

7) "Koceks"

Koceks are known to be male dancers entertaining males. They would dress up like woman, but not like transvestites. Does not have the sexual connotation. Purely entertainment purposes.

In the Turkish culture there are male dancers, called koceks- this tradition has its roots in Ottoman era; nowadays it is considered more folkloric. A guy dresses up as a dancer, dances and sings/entertains etc., and other men watch him perform.

The Radio and Television Supreme Council in Turkey banned the television reality program "He's a Lady Now," in which men would compete to best dress and act like a woman. According to the report, the program was banned following an alleged public protest.

8) Men-"buddies" walking arm-in-arm and hugging/kissing in public / dancing; no sexual implication.

9) Circumcision ceremony
There are many things about the circumcision business that may be worked into a vignette:
1. outfit -- and how kids are made to walk in public in these outfits--more funny than disgusting
2. no anesthesia & the operation (a family elder holds the kid tight and people chant as he is circumcised)
3. public circumcision ceremonies where municipalities have hundreds of kids circumcised at stadiums
4. foreign groom gets circumcised because of family pressure

The family starts to prepare the child for the circumcision a few days before the ceremony. In fact, the child begins to experience the joy and the fear of the operation long before that. In traditional communities, parents start to prepare their son for this significant turning point in life months beforehand.

A special circumcision outfit is the most important part of the preparations for the ceremony. Rich families adorn their sons with jewels in big cities, and a light blue headgear on which the

word "Maşallah" is embroidered on the front is the most common element of circumcision outfits there. In villages, the children who will be circumcised wear new outfits; a "çevre" (a surrounding piece of cloth) and "yağlık" (a large napkin) are hung around their necks and shoulders, and bridal tinsel is hung from the back of their headgear. A few days before the ceremony, or even on the day itself, the children to be circumcised are paraded around with their friends, either on horseback, on a cart or else by car. People are informed by means of this parade that the child is to be circumcised.

The circumcision procedure consists of cutting off the child's foreskin. The boy is sat on the lap of his kirve (someone who acts as a kind of godfather at the circumcision) if he has one, or if not, on the lap of some other relative. The boy is made to open his legs, and the person whose lap he is sitting on holds the boy's arms very tight. Meanwhile, encouraging words stressing manly virtues are spoken in order to help reduce the child's fears. Before and during the operation, the words "Allahu ekber Allahu ekber" are uttered, and people recite a very common bantering couplet "oldu da bitti maşallah, iyi olur inşallah" (It has happened at once, May God preserve him; it will grow better, by God's will). The person who carries out the circumcision procedure; that is, the operation, is generally referred to a "sünnetçi", meaning circumciser. This individual is also known as the "abdal" (wiseman) or "kızılbaş abdal" (scarlet-head wiseman) in Central and Eastern Anatolia.

10) Woman Beating / Killing / Honor-killings
A young girl is raped, and to clean the family's honor/name she is murdered by her brothers/uncles/father.... (many variants of this is possible). Typically the family won't take the body, so these girls are buried by members of NGOs to homeless cemeteries.

11) Abortion
More recent stuff-the government pushed a ban on abortions- it is still legal, but the doctors can refuse it, a lot of pressure against it. Worse case it some hospitals have started to perform abortions without anesthesia and belittling woman throughout the surgery, treating them as whores etc.

12) Police violence
Police officer attacked a protestor (a highschool student) and aimed and shot a teargas bullet in close range injuring a girl, 17 years, hospitalized & coma. They did this after they pulled her out from the building she was hiding.

13) Imam & sex & religious marriage
- The Islamic version of priest & child molestation sex scandal.
- People get a "religious marriage" by an imam for a few hours/days to basically have sex.
- *A college prof. gets a religious marriage with a student to force her into sex, blackmails her etc.

APPENDIX D: APPROVAL FROM ONR TO CONDUCT STUDY 3

From: Kim, Joong H CIV ONRA, 30 <joong.kim@navy.mil>
Sent: Tuesday, April 28, 2015 3:39:44 PM
To: Chevillet, Mark A.
Cc: Kollmorgen Gary (gkollmorgen@gskinc.net); Merkle, Andrew C.; Mastroianni, Lee CIV ONR, 30
Subject: RE: N00014-12-1-0629_REQUEST FOR A NO COST EXTENSION

The approval has been submitted with the POP end date changed to Dec 31 2015. Please proceed with the new plan. I still expect the project to be concluded by the end of the fiscal year.

v/r,

Joong Kim, PhD
Program Officer, Code 30
Office of Naval Research
Ph: 703-696-4742
Email: joong.kim@navy.mil
SIPR: joong.kim@navy.smil.mil

-----Original Message-----
From: Chevillet, Mark A. [mailto:Mark.Chevillet@jhuapl.edu]
Sent: Tuesday, April 28, 2015 3:26 PM
To: Kim, Joong H CIV ONRA, 30
Cc: Kollmorgen Gary (gkollmorgen@gskinc.net); Merkle, Andrew C.; Mastroianni, Lee CIV ONR, 30
Subject: Re: N00014-12-1-0629_REQUEST FOR A NO COST EXTENSION

Hello Dr. Kim,

We are sympathetic to your request (sent recently via Mr. Kollmorgen) to proceed with spending on schedule, but are unsure whether to proceed with our altered plans prior to receiving your approval (the original planned experiments cannot be conducted in this case due to their need for human subjects research approval). Per your request, we provided the outline included below describing the proposed changes to the experimental plan (to accommodate the decision not to pursue human subjects research approvals) and I wanted to check in to see whether you'd had a chance to review it? We would be happy to discuss if it would be helpful.

Please let me know if you would like us to proceed with the revised plans, or await your approval before proceeding, and/or whether you'd like us to arrange for a time to discuss either in person or on the phone.

Best,
Mark

Mark A. Chevillet, Ph.D.
Program Manager, Applied Neuroscience

REDD-2015-384

Research and Exploratory Development DepartmentJohns Hopkins University Applied Physics LaboratoryPhone: 443-778-3514 (Baltimore) / 240-228-3514 (Washington)

On 4/17/15, 5:11 PM, "Chevillet, Mark A." <Mark.Chevillet@jhuapl.edu> wrote:

>Hi Dr. Kim,
>
>My sincere apologies. I was unsure of the correct procedure, but should
>have ensured we touched base with you before sending this request.
>
>Please let me know if you need something more formal, or if you would like
>to discuss directly, but an outline of the re-planning from the PI
>(Jonathan Kopecky) is included below. Should you choose to grant the
>extension, the end of the fiscal year would allow for a smooth execution
>of the proposed plans.
>
>Please let me know if I can provide any additional information.
>
>Best,
>
>Mark
>
>Mark A. Chevillet, Ph.D.
>Program Manager, Applied Neuroscience
>Research and Exploratory Development Department
>Johns Hopkins University Applied Physics Laboratory
>Phone: 443-778-3514 (Baltimore) / 240-228-3514 (Washington)
>
>
>
>The neural correlation of cross-cultural adaptation is an ONR-sponsored
>project designed to investigate the culture-general skills and traits
>needed to succeed in interacting successfully with people from other
>cultures. The goal of this project was to better identify these skills (so
>we could better train these skills) or these traits (so we could better
>select personnel exhibiting those traits). As part of this project, there
>were two proposed experiments. The first was an online behavioral
>experiment assessing personality and psychometrics measures, to be
>correlated with subsequent peer recommendations. The second was an fMRI
>study that examined the neural correlates of high and low-performers in
>our behavioral assessment to see if there were differences in emotion
>regulation and non-verbal communication ability.
>
>In November, 2014, we received notice that the HRPO approval request would
>not be submitted due to time and cost associated with the process having
>not been previously planned. As the two planned experiments both required

>HRPO approval, neither could then be executed. While addressing this
>issue, we came into contact with The Army Special Forces and their Special
>Forces Assessment and Selection course (SFAS), who are also interested in
>cross-culture adaptation. Because research in this domain is limited, they
>were unsure what skills to train or what traits best predict success. As
>part of their process, they collect and maintain data on the behavioral
>and physical assessments of SFAS participants and had access to roughly
>6000 participants. The SFAS group offered to pull together these data and
>de-identify them, in which case their analysis would not qualify as human
>subjects research. They are currently in the process of collecting and
>de-identifying these data to provide to JHU/APL. We propose to analyze
>these data in the hopes of quantitatively determining which measures best
>predict success in SFAS.
>
>The data includes many measures related to culture-general skills,
>including the defense language acquisition battery scores (DLAB), defense
>language proficiency test scores (DLPT), various measures of IQ, various
>measure of physical fitness, and certain measures that combine the two,
>such as assessments on a test that combine navigation and speed. For each
>participant, personality metrics and peer assessments were also included.
>Should it be possible to sufficiently de-identify those data, they would
>be provided for correlational analyses as well. All data were previously
>collected (during 2013 and 2014) and are to be de-identified before ever
>being provided to JHU/APL.
>
>Data are expected to be available within the next month, leaving little
>time to analyze them before the current end of the Period of Performance
>in June. Should it be possible to extend the period of performance to the
>end of the fiscal year, these data could be thoroughly analyzed and the
>results properly documented as a concrete outcome of the neural
>correlation of cross-cultural adaptation project. Your consideration of
>this request is greatly appreciated.

APPENDIX E: IRB PROPOSAL

1.   **Abstract**

What contributes to an individual's success in work situations demanding adapting to various cross-cultural circumstances? In what way do emotions and stress impact reasoning, decision making, interpretation of behaviors and judgment of other's intention in such work situations? It is here asserted that there are three main contributors to expertise in cross cultural adaptability: 1) cultural sensemaking, 2) moral reasoning capability, and 3) social mindreading skill. In Part 1 of this two-part study, we will conduct an examination of cognitive, emotional, and social factors that are likely to underlie expertise in these three contributors, and through them to cross-cultural

adaptability in general. Specifically, we will administer a series of self-report assessments to participants experienced with and competent in adapting across cultures (experts), and a novice comparison group of participants who lack experience in cross-cultural adaptation. These data will be collected via an on-line survey web site. As a result of Part 1, we will be able to characterize the trait- and performance-based attributes and skills associated with cross-cultural expertise. Having then determined the behavioral characteristics of cross-cultural expertise, we will proceed to the Part 2 study whose purpose is to examine the underlying neural mechanisms of cross-cultural expertise as related to moral reasoning and social mindreading.

2.   Objectives

The primary objectives of the present study are:

- Contrast cross-cultural experts (individuals who are experienced with and skilled in interacting across cultures) with novices (those individuals who are less experienced with cross-cultural challenge).
- Determine the set of trait- and performance-based behavioral assessments that discriminate the expert and novice cohorts.
- Confirm and explore the competence, approach, and interpretation in moral reasoning challenge as observed in experts and novices.
- Establish and determine a differential characterization of the expert and novice in terms social mindreading skill.

3.   Background

There is considerable civilian and military interest in determining which individuals are best suited for working abroad.   Much of this research focuses on long-term acculturation, which is most applicable when migrating to one particular culture (see, for example, Berry, et al., 2002). However, for certain types of jobs, individuals are required to go to multiple locations and spend a relatively short amount of time (on the order of months) at each place thereby prohibiting integration and familiarization with that native culture. Despite the constraints of the length of time within each cultural environment, the assignments demand extensive and often high stake interactions with locals. These circumstances can be difficult and are often emotionally charged and fragile (Goodwin, 2005). There are different issues involved in this type of short-term scenario, to which we refer as "cross-cultural adaptation," versus long-term migration.

For some short-duration missions, general-culture competency and skills such as knowledge about the typical schedule and food preferences are sufficient. However, there are short-term missions for which these general-culture skills are insufficient and culture-specific skills are required to assure that one's mission is accomplished. For example, the skills required for a Francophile to successfully immigrate and integrate into French

culture is very different than the skillset required to work in France for three weeks, work in Italy for two months, then consult in China, etc. Living and working in so many different cultures can be particularly stressful, as one never has a chance to acculturate sufficiently to feel comfortable in that particular culture. It also requires the ability to assimilate information quickly, not only to learn about the culture rapidly but also to adjust one's knowledge of the culture as one interacts with people from that culture.

A general framework for cross-cultural psychology (Vaughn & Phillips, 2009) has identified three major requirements for successful cross-cultural interactions: intrapersonal competence, interpersonal competence, and cultural competence. Intrapersonal competence refers to the knowledge of one's self and individual mental skills such as self-control, openness to new situations, and levels of intelligence. Interpersonal skills focus more on social skills; it has been clearly demonstrated that those who lack interpersonal skills within a mono-cultural situation will demonstrate poor cross-cultural skills as well (see, for example, Bochner, 2003). Cultural competence includes culture specific knowledge, such as proficiency in the appropriate language and the awareness of cultural norms and taboos, but also more universal abilities such as adapting well in changing circumstances and making sense of unfamiliar social environments (Vaughn, 2010).

This study proposes a related, but somewhat more focused, perspective on the requirements for successful cross-cultural interactions. While a number of cognitive and emotional skills may be important, to varying degrees, to one's knowledge of oneself, it is here hypothesized that the ability to successfully navigate the differing morality landscapes of other cultures, referred to here as *moral reasoning*, is the key intrapersonal skill underlying cross-cultural expertise. This study will measure a number of intrapersonal skills and characteristics, but the focus is on the individual's capability for moral reasoning. The second phase of this study, currently under development, will propose an investigation of the neural bases of moral reasoning, in part to determine the relationship between the brain circuits implicated in moral reasoning skills and those implicated in related intrapersonal capabilities such as working memory and cognitive control.

In terms of interpersonal skills, a great deal of attention has been focused over the past fifteen years on *social mindreading*, which generally refers to an individual's ability to infer the internal mental states (e.g., worried, afraid, puzzled) of another person, and to use that inferred state to predict that person's likely actions. Also referred to in the literature as "theory of mind" or "mentalizing," a major deficiency in social mindreading skill is believed to lie at the heart of the social deficits of those suffering from autism spectrum disorder (Baron-Cohen, 1985; Frith & Frith, 2006; Apperly, 2012). It has been postulated that mindreading may be one of the most important, as well as one of the most vulnerable, of all interpersonal social skills (see, for example, Adolphs, 2010).

Cultural competence, the third of the Vaughn & Phillips triad, is not as easily reduced to a specific skill. However, early work by Sieck and his colleagues (2008) focused

attention on the high-level skill of sensemaking, as originally proposed by Klein and his colleagues (1993) and refined by Weick (1995). Sensemaking is the idea that people interpret a situation by fitting incoming information into a frame that links them to other elements (Klein, Phillips, Rall, & Peluso, 2004). This is related to the notion of cognitive flexibility because people have to be able to hold many frames in mind and test these various frames against incoming information. The Sieck focus on *cultural sensemaking* is a natural fit to the cultural competence leg of the triad and is the third major focus of this study.

Previous research regarding cross-cultural adaptation is based on self-reported data (either interviews or questionnaires) to discover so-called "critical components" of culture-general adaptability. However, self-report studies have significant risks that often make the results more variable than they might otherwise be. This complicates the ability to clearly identify the underlying factors associated with success or failure, and may account for the poor agreement between these studies as to the factors that are the most critical for cross-cultural adaptability. Based on the multi-cultural personality questionnaire (van der Zee, van Oudenhoven, & de Grijs, 2004), college students scoring high in emotional stability and cognitive flexibility reacted more positively to a stressful intercultural situation relative to students scoring low in emotional stability and cognitive flexibility. In a study of peacekeepers, Vanderpool (2002) reported that attention to interpersonal relations and being open to new experiences, as assessed by the cross-cultural adaptability scale, accounted for the greatest variability in their achievement of their mission. Ross et al. (2010) administered the cross-cultural competence inventory test to military personnel and reported that cognitive flexibility, cross-cultural empathy, openness, and a willing to engage with other cultures were the key factors their success with challenge requiring cross cultural adaptation. Although the specific results of these three studies are not identical, cognitive flexibility and open-ness were commonly identified as key to cross cultural competence.

In contrast to self-report metrics, the specific psychological instruments and tasks proposed here will the objective assessment of cross-cultural adaptability while minimizing those problems associated with self-report data. To this end, we intend to administer performance-based tasks to experts and non-experts in cross-cultural adaptation, as well as self-report questionnaires. These tasks, along with the necessary procedures for conducting them and analyzing the resultant data, are detained in the Study Procedures section below

This protocol constitutes Phase 1 of a two phase study. The second phase will build on the results to be obtained in this phase by utilizing functional brain imaging techniques to explore the neural bases of moral reasoning and social mindreading as they relate to cross-cultural expertise.

4. Study Procedures

A. Study Design

1. Participants

All participants will be adults between 18 and 60 years of age. Some of the participants will be recruited by the research project's sponsor (the Office of Naval Research, or ONR) from among current active-duty military personnel, while others may have significant past experience in military operations or government foreign service. Both male and female participants will be accepted, although we anticipate having fewer females volunteer to participate because of their limited numbers within the military and ex-military populations.

In this first phase of the study, data will be collected online (i.e., over the Internet) from two types of volunteer participants: *nominators* and *performers*.

- A *nominator* is a participant who is willing to nominate one or more individuals that he/she knows well and whose cross-cultural skills and experience seem to be a good match for this study. He/she will complete online questionnaires providing justification for why their nominee(s) should be considered.
- A *performer* is a participant that fits the desired set of cross-cultural skills and experience for this study. He/she will first complete an online survey in which their particular background and experience in cross-cultural interactions will be documented. The performer will then take a series of behavioral and performance-based psychological tests that are expected to provide quantitative data regarding the mental, emotional, and social skills of cross-cultural experts and non-experts.
- A performer does not need to first be nominated in order to participate. Likewise, a nominator may also participate as a performer, if he/she wishes. The purpose of the nomination process is to provide a subjective third-party perspective of a given performer's cross-cultural skill set, and not to restrict anyone who wishes to participate as a performer from doing so.

The participants will take these questionnaires, surveys, and tests online from remote locations of their own choosing via a website created by JHU/APL specifically for this project, and their data will be collected and stored by the research team at JHU/APL. Although some participants may live or work in the local area, it is anticipated that the research team will not interact face-to-face with any of the participants during this phase.

a. Nominators

Nominators will assist the categorization of the performers (as described in the next section) by providing additional insight as to the level of cross-cultural expertise possessed by the person(s) being nominated. The

nominator will be asked to provide an email address for each person being nominated; the website will then automatically generate an email to the nominee inviting them to consider volunteering for the study. Nominators will not be informed by the research team as to whether or not their nominees decided to participate. Neither the submitted email addresses nor any of the collected nomination questionnaire data will be made available to anyone outside the research team or (upon written request) the federal research sponsor (ONR).

b. Performers

Performers will be recruited to fill two groups: 'experts' and 'non-experts'. The decision as to which of the two groups a given performer is to be placed will be largely subjective (though not arbitrary). Those performers who have extensive field experience in cross-cultural interpersonal situations and claim to have solid expertise in such interactions will be considered for inclusion in the 'expert' group, as will those who have been nominated as experts by their peers (i.e., nominators). All other performers will be assigned to the 'non-expert' group.

All performers will take the same tasks during the course of the experiment. The actual grouping of the results will take place after a given performer's tests, etc., have been completed and submitted, and performers will not be told into which group their results will be classified.

2. Recruitment

a. Active Duty Military (ADM) Participants

Active Duty Military participants will be contacted by a Military Liaison Officer (MLO) designated by the funder, the Office of Naval Research, as described below. Recruitment will remain in compliance with DoD Directive 3216.02, "Protection of Human Subjects and Adherence to Ethical Standards in DoD-Supported Research" dated 8 November 2011 (further discussed on the JHM IRB website at http://www.hopkinsmedicine.org/institutional_review_board/guidelines_p olicies/guidelines/dod_reqs). This directive requires approval from commanding officers before active duty personnel can participate in research studies, but are recruited in such a way that their participation remains voluntary. Commanding officers are not informed as to who in their command has participated in a study.

The specific procedures to be utilized by the research team to recruit its participants are detailed below.

1. The sponsor of this research (ONR) will designate a member of its organization as the responsible official for coordinating and facilitating the recruitment of active-duty military personnel (referred to here as the Military Liaison Officer, or MLO). As of this date, ONR has designated Mr. John R. Garvin (ONR Technology Test & Demonstration Office, Code 302) as the MLO, but reserves the right to name a replacement at its own discretion.

2. The primary responsibility of the MLO is to obtain command approval for all of their personnel before they are contacted for the research study. The MLO will initially contact US Marine Corps (USMC) operating forces headquarters, such as Marine Forces Command (the senior operational headquarters for all US Marine Corps operating forces) and the USMC Training & Education Command, to obtain command support for reaching out to individual marines as participants. With the concurrence of these commands, the MLO will then contact additional subordinate commands as necessary.

3. The MLO will provide each organization with a Research Study Liaison Document that provides:
• pertinent details and constraints of the study,
• the operationally relevant benefits of participation,
• the requirements for participation in the study,
• assertions that any data collected will be anonymous,
• assertions that the individual service members' respective chains of command will not be informed who participated or how they responded, and
• a request that interested participants be authorized time during the training day to complete the online assessments for this study.

4. If a given organization agrees to participate, the MLO will provide the approved recruiting materials (posters, etc.) that list the website address. If desired, the organization may choose to designate a Unit Liaison Officer (ULO) to assist with the recruiting effort, provided that the voluntary participation and privacy clauses of the liaison document are inviolable.

5. No one outside of the JHU/APL research team will be aware of who has or has not elected to participate in the research.

6.   Under no circumstances will JHU/APL initiate first contact with any active-duty military personnel who have not been nominated (nominees are automatically contacted via email by the website software).

b. Non-ADM Participants

Recruitment efforts for potential volunteers from outside of the active duty military community will utilize more conventional methods; specifically, a targeted community outreach effort based on recruitment flyers, social network advertisements, etc.. The same recruitment materials will be used to reach out to all potential participants, both ADM and non-ADM. The specific forums will be chosen to maximize the probability of reaching those individuals with the desired cross-cultural expertise.

c. JHU APL Participants

JHU APL personnel will be recruited as participants for the associated pilot study that will develop new experiment stimuli. Recruitment efforts for APL personnel will be overseen by the APL Health and Environmental Services (HES) Department and will comply with the applicable APL policies and procedures.

3. Experiment Tasks

a. Nominators

1. Nomination Questionnaire

The purpose of the Nomination Questionnaire is to collect third-party information regarding the perceived skill level of a nominated (potential) performer. This questionnaire focuses on the nominator's opinions regarding the nominee's capabilities in real-world cross-cultural situations, presumably gained through shared experiences or personal observation.

2. Ideal Cross-Cultural Expert Questionnaire

It is desirable to obtain a detailed understanding of the nominator's perspectives on cross-cultural expertise. Consequently, the nominator will also be requested to complete a questionnaire in which he/she is asked to characterize the capabilities that would be possessed by the best cross-cultural adapter they could imagine.

b. Performers

There are a number of standard or commonly-used instruments and tasks available to quantitatively examine the specific psychological skills on which this study focuses. However, it is impractical to include all of the desirable measures if the total time being asked of any one participant is to be limited to two hours. Therefore, the list of performer tasks in this section should be considered a superset of the ones that will actually be deployed on the website for the experiment. The choice of which tasks to drop will be made during the final development of the website, balancing the information to be gained by each task with the time requirements and difficulties of employing the respective tasks in an online system.

1. **Demographic and Experience Questionnaire**

   We will collect some demographic information about each participant. This will include information like age and gender, but also information about any previous deployments and how often they have engaged in activities such as traveling abroad.

2. **Cultural Sensemaking Task**

   Sieck, Smith, & Rasmussen (2008) found that a critical differentiating feature between experts and novices in cross-cultural situations was the ability to engage in cultural sensemaking. This ability to index content, make attributions and then select schema is a key differentiator in determining current ability at cross-cultural adaptability. Sieck and Rasmussen have been developing a cultural sensemaking task that we will administer to our participants. This task will feature about 24 different vignettes about cross-cultural situations and participants will have to answer a series of questions about each vignette.

3. **Moral Reasoning Tasks**

   As noted above, moral reasoning capabilities are at the heart of this study. The tasks listed below have been recommended to the study team by several of the most reputable researchers that specialize in this area.

   a. **Moral Foundations Questionnaire (MFQ)**

      The Moral Foundations Questionnaire (Haidt & Graham, 2007; Graham et al., 2011) will be administered to participants. This 30-item assessment assesses five dimensions of moral intuitions: harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, and purity/sanctity. Responses are organized on a Likert scale.

b. **Condensed Moral Vignettes (Knutson et al., 2010)**

Selected vignettes representing a spectrum of challenge will be administered ranging from compassionate to regretful, sneaky, embarrassed etc. We aim to include challenges that are positive, neutral and negative in valence. Participants are asked to rate (on a numbered anchored rating scale) the vignettes along the following dimensions: emotional intensity, emotion aversion, harm, self-benefit, other-benefit, pre-meditated, illegality, social norm violation socialness, social norm violation and morally appropriate.

c. **Cognitive Reflection Test**

The Cognitive Reflection Test (CRT) is designed to assess an individual's ability to suppress a spontaneous, intuitive (though incorrect) answer in favor of a more reflective, deliberative (and correct) answer. The participant is presented with a series of "brainteasers" to be answered as quickly and as accurately as possible. It is generally considered to place considerable demand on the individual's cognitive control mechanisms.

d. **Need for Cognition Scale**

The Need for Cognition Scale quantitatively measures "the tendency for an individual to engage in and enjoy thinking" (Cacioppo & Petty, 1982, p. 116). The instrument consists of 18 statements. The participant responds to each statement using a 9-point scale signifying the degree to which he/she agrees with that statement. In general, the instrument takes 10 minutes or less to complete.

e. **Wisdom Assessment**

The Three Dimensional Wisdom Scale (3D-WS) is a 39-item instrument that examines the cognitive (14 items), reflective (12 items), and affective (13 items) dimensions of wisdom (Ardelt, 2003). Each item is a statement to which the participant responds (on a 5 point scale) how much he/she agrees or disagrees with the statement. Although originally created for use with older adults, it will add a unique dimension to the assessments proposed for this study.

f. **Profile of Mood States (POMS 2-A Short)**

The Profile of Mood States (POMS) (McNair et al., 1981) is a self-report scale that allows for the quick assessment of transient, fluctuating feelings, and enduring affect states. The tool is applicable in clinical, medical, research, and athletic settings and is sensitive to change. The POMS

consists of seven subscales: Anger-Hostility, Confusion-Bewilderment, Depression-Dejection, Fatigue-Inertia, Tension-Anxiety, Vigor-Activity, Friendliness.

g. ERQ (Gross & John, 2003)

ERQ is a 10-item measure of emotion regulation strategies on a 7-point scale (1 = *strongly disagree* and 7 = *strongly agree),* yielding two independent subscales for cognitive reappraisal and expressive suppression with adequate reliability. Frequent reappraisal, compared with frequent suppression, is associated with greater positive mood, social functioning, and psychological well-being and lower negative mood (including depressive symptoms) compared with frequent suppression.

h. Emotional Stroop Task

The Emotional Stroop test (Gotlib et al., 1984) is a task designed as an information-processing approach to assessing emotions. Related to the standard Stroop effect, the Emotional Stroop test examines the response time of the participant to name colors of negative emotional words. The Emotional Stroop assesses attention and response time due to the emotional relevance of the word for the individual (Algom et al., 2005). The Emotional Stroop test has been used broadly in clinical studies using emotional words related to a particular individual's area of concern, such as alcohol-related words for someone who is alcoholic, or words involving a particular phobia for someone with anxiety or phobic disorders.

i. Mood Awareness Scale

The Mood Awareness Scale was created by Swinkels & Gulianoto (1995) to evaluate an individual's ability to assess his/her own mood. Research findings suggest that, compared with low mood monitors, high mood monitors show greater self-consciousness, are more neurotic, have lower self-esteem, and experience greater negative affect. Compared with low mood labelers, high mood labelers tend to be less socially anxious, less neurotic, more extraverted, and more nonverbally expressive, and to experience greater positive affect (Swinkels & Guilianoto, 1995).

4. Mindreading Tasks

The following tasks are under consideration for inclusion in this study. While there are many different mindreading tasks in the published literature, four have been identified as the most suitable for the goals of this study. Because of the excessive time that would be required to have all of the participants

perform all four of these tasks, it is unlikely that all four will be utilized in this phase of the research. Current plans call for two of the four to be selected based on the availability of stimuli, pilot data, and recommendations from outside experts.

The four tasks are described in more detail below.

a. **The Strange Stories Task (Happe, 1994; Jolliffe & Baron-Cohen, 1999)**

A set of 24 short vignettes, each accompanied by a picture and two test questions, is presented to participants. The vignettes concern everyday situations where people say things that they do not mean literally. The story types are classified as: lie, white lie, joke, pretend, misunder-standing, persuade, appearance/reality, figure of speech, sarcasm, forget, double bluff, and contrary emotions. Six additional stories are used as controls and involve unforeseen outcomes with a mechanical or physical cause.

b. **Visual Joke Appreciation Task (Corcoran, Cahill, & Frith, 1997)**

Two sets of 10 visual comics or jokes are presented to participants who must explain why the jokes are funny. One set of jokes involves slapstick or behavioral humor, while the other set requires an understanding of the main character's mental state

c. **Reading the Mind in the Eyes Task (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001; Adams et al., 2010)**

The participant is presented with a series of 36 photographs of the eye region of the face of different individuals, and is asked to choose which of four words best describes what the person in the photograph is thinking or feeling (e.g., "serious", "ashamed", "alarmed", "bewildered"). Some of the faces will be of Caucasian Americans, and others of different cultural groups (e.g., Turks).

d. **Non-verbal Attribution of Intention Task (Brunet et al., 2000; Brunet et al., 2003)**

 In this task, the participant is presented with a series of three-panel comic strips that convey a vignette about an individual. The participant is then given three alternative pictures that serve as potential endings to the vignette. In order to select the correct picture, the participant will need to correctly infer the character's intention in the first three panels.

5. Psychological Assessments

The tasks described below are focused on specific mental characteristics that will be used to supplement the findings from the cultural sensemaking, moral reasoning, and social mindreading tasks above. If the study's hypothesis is correct, then the test results from the tasks in this section will either be highly correlated with the previous tasks, or will account for relatively little of the variance between the two groups.

a. Intelligence Assessment

We will administer two to three tasks from the Manual for Kit of Factor-Referenced Cognitive Tests ((Ekstrom, French, Harman, & Derman, 1976; Roberts et al., 2000) to our participants as a way to estimate general fluid intelligence (GFI). These cognitive tests have previously been applied to a military population, and have been broken down into different factors to allow us to better determine certain cognitive factors we think most relevant. We will focus on tasks that relate to induction ability and integrative processes, two key components of both general fluid intelligence and of sensemaking. The score of GFI will be used as a covariate to control for other factors to allow us to better determine what explains difference in ability beyond any differences in intelligence ability. If GFI is sufficient to explain performance in cross-cultural adaptability, this would be an important finding. It generally takes about 7 minutes to do each task, so should take about 20 minutes or less to do all the tasks we administer.

b. Operation Span

The operation span task, or OSPAN (Turner & Engle, 1989) is a test of working memory span that alternates between doing simple mathematical tasks and reading letters, followed by a recall task of the letters presented. This task correlates with Raven's (Unsworth & Engle, 2005), so can be viewed as a supplement to the IQ test. It takes about twelve minutes to conduct this test.

c. NEO-FFI

The Neuroticism-Extroversion-Openness Five-Factor Inventory or NEO-FFI (Costa & McCrae, 1992) is a 60-question five-factor personality assessment. Of particular interest to us are questions relating to openness, as previous research has sometimes shown that openness to new experiences and new ideas correlates with cross-cultural skills (Ross et al.,

2010; Vanderpool, 2002). We hypothesize that experts will score higher on tests of openness than will novices.

d. MPQ-40

The short form of the multicultural personality questionnaire (van der Zee, van Oudenhoven, Ponterotto, & Fietzer, 2013) is 40 questions with five subscales: cultural empathy, emotional stability, social initiative, open-mindedness, and flexibility. The MPQ predicts variability in cross-cultural behavioral competence beyond the big 5 personality traits. We expect to find experts score higher on all subscales than do non-experts.

e. IRI

The interpersonal reactivity index (Davis, 1983) is a 14-item self-report that measures empathy. Although we will administer the whole test, we expect that two of the subscales in particular will differentiate experts from non-experts: perspective-taking and empathic concern. We expect that these seven items will load higher for experts than for non-experts.

f. EIS

The emotional intelligence scale (Schutte et al., 1998) is a 33-item questionnaire measuring emotional intelligence, appraisal and regulation. Questions are rated on a five-point Likert scale. We expect that experts will score higher on this scale than will non-experts.

g. CQS

The 20-item cultural intelligence scale (CQS) is meant to predict an individual's capacity to perform effectively in cross-cultural situations (Ang et al., 2007). We expect, as previously found by Abbe & Bortnick (2010), that those with more experience and more expertise will score higher in CQS. The subscales of the CQ Scale (CQS) assess four dimensions: metacognitive CQ, cognitive CQ, motivational CQ and behavioral CQ.

4. Overview of Study Procedures

Most of the study tasks and associated stimuli for this experiment are based on standard psychology instruments or on tasks that have already been published in the open scientific literature. However, in a few key cases it will be necessary to prepare and validate new stimuli in order to better achieve the objectives of the research. Procedures for developing and validating new stimuli via initial pilot studies are described in the first section below.

The remainder of this section covers the procedures to be followed during the actual performance of the study. This study relies heavily on a set of web pages and associated software to administer the consent procedures, manage the nomination process, link the data supplied by nominators to their nominees (for those nominees that volunteer to be performers), administer the experiment tasks and questionnaires, and collect the data for subsequent analysis. The procedures to be employed by the web pages and followed by participants are described below.

a. Pilot Studies of New Stimuli

1. New "Reading the Mind in the Eyes" Stimuli

New 'eyes' stimuli will be prepared and piloted utilizing a similar procedure to the one used during the development of the original stimuli (Baron-Cohen, et al., 2001).

a. Generation of New Stimuli

Fifty images of faces from the identified culture/race will be selected from publically-available sources (e.g., magazines, the Internet, etc.) and then cropped and reformatted to comply with the original grey-scale, 500 x 200 pixel format of the original stimuli. Target words and foils will then be generated by members of the research team. The target words and foils will be selected from the list used in the original research (Appendix A of Baron-Cohen, et al., 2001).

b. Pilot Study

Teams consisting of eight evaluators will be used to pilot test the new stimuli. In order for a given stimulus image to be rated as acceptable, both of the following two conditions must be met:

1) at least five out of the eight evaluators must select the same target word, and

2) no more than two of the remaining evaluators can select the same one of the three available foils.

Items that fail to meet both of these requirements will either be discarded or reworked with new target words, foils, or both. Reworked stimuli will be re-piloted by a new group of evaluators until they meet both of the requirements listed above.

After successfully passing the evaluator teams' testing, the stimuli will be piloted with a larger group (N = 40) of volunteer graders recruited from within APL. The stimuli will be presented via a custom web site and evaluated by the graders online. In keeping with the goals of this research, an effort will be made to recruit volunteer graders from diverse ethnic and cultural backgrounds. In order for a given stimulus image to be rated as acceptable, both of the following two conditions must be met:

1) at least 50% of the graders must select the target word, and

2) no more than 25% of the graders can select the same one of the three available foils.

At the conclusion of the pilot, 36 of the piloted stimuli from within each of the two novel racial/cultural groups will be selected on the basis of their pilot scores. This will yield a final experiment stimulus set of 144 stimuli: 36 each from the Caucasian, African-American, Arab, and Oriental groups.

b. Data Collection Software. Data collection for this study will be done using Qualtrics (qualtrics.com), a well-established online survey administration service. JHUAPL owns a license and uses this service frequently. Study PI Jonathon Kopecky and study team members Jason Spitaletta and Nathan Bos have access to the account at this time; other study team members will be given accounts only if needed. Respondents login to the system with their email address. (Passwords would not offer any added security benefit in this system. While it is possible that another person could log in with a respondent's email, this would not allow them to access prior responses.) Data sent to and from Qualtrics is encrypted with SSL.

Within the system, participants' email is is kept in one file (internally referred to as a 'panel') linked to an ID number. The ID is the only identifier used in the survey response files. Because biographical data on deployments and overseas work is included in both the Nominator and Respondent surveys, this data is considered to contain indirect identifying information, and is handled accordingly.

Qualtrics' statement on data security is available on request. Qualtrics conducts background checks on employees and limits access to customer data to a small set of database administration personnel.

c. Web Site Registration Procedures

This protocol is based on the concept of remote (conceivably from all over the country) volunteers logging into a web site and completing questionnaires and tests without any need for them to interact directly with the research team. In order to make this system work, a Qualtrics web site will be created by JHU/APL to support the necessary experiment procedures, consent processes, and data collection, as well as to provide mechanisms for protecting participant privacy (e.g., through the automated association and de-identification of data).

The web site will use a participant's email address as a user name, and will link the various data from multiple sources (e.g., from multiple nominations and the participant's own performance data) using the email address as the key. Nominators will be required to provide an email address for their nominees (see section [c] below), and performers will register using their email address as described in this section. It should be noted that the participant's name and email address will not appear in any of the data supplied by the system; the system will assign a random identifier (e.g., 'p-54') to each participant which will replace the email address in the database provided to the research team.

All potential participants must register prior to utilizing the website. The registration process is described below.

1. Upon reaching the home page of the web site, the user will see a brief description of the study's purpose and a list of the inclusion requirements for study participants. There will be a statement encouraging those who meet the criteria to register (if this is the first time visiting the site) or log in (if already registered) to the site.

2. Registration will require the user to provide his/her email address. In addition, a random non-machine readable word will be displayed, which the user must type into a response block in order to prevent automated algorithms (robots) from entering the site.

3. To ensure that the email provided by the user is a workable address, an email will be automatically sent to the provided email address that contains a link for finalizing the registration. When the user logs into his/her email account, reads the email, and selects the confirmation link, he/she will be registered into the database as a registered system user.

4. Once the user has successfully logged into the system, he/she will be transferred to a subordinate web page that explains the two roles for participants: 'nominator' and 'performer.' Selecting a particular role

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will then transfer the user to the portion of the site dedicated to that role, as described in sections [d] and [e] below.

5. Registered users may log out of the site and then return at a later time or date as necessary or convenient. However, once a 'performer' has completed the questionnaires and experiment tasks associated with that role, he/she will be unable to return to the 'performer' pages of the site for the duration of the experiment.

d. Nominator Procedures

A participant that wishes to nominate one or more individuals with whom he/she is familiar may do so by volunteering as a nominator. The nomination process will be handled completely by the Qualtrics software within the JHU/APL website, as described in more detail below and summarized in Figure 4-1. A participant may elect to withdraw his/her consent to participate at any time up to the final data submission (step 5 below), and all nomination materials (names, emails, questionnaire results, etc.) will be excluded from any analyses.

1. A participant who wishes to nominate one or more individuals will log into their account on the JHU/APL website (if not already logged on). He/she will then select the "Nominator" role.

2. Once in the "Nominator" section, the participant will be provided an electronic consent form. If the participant understands the information and agrees to continue his/her participation, he/she may move on to the nomination process. If the participant has questions or concerns about the consent document, then he/she will be directed to send an email to the PI to obtain clarification, and will be permitted to logout and return after the questions or concerns have been answered. If the participant declines to consent to the form, then the session will be cancelled and the participant logged off.
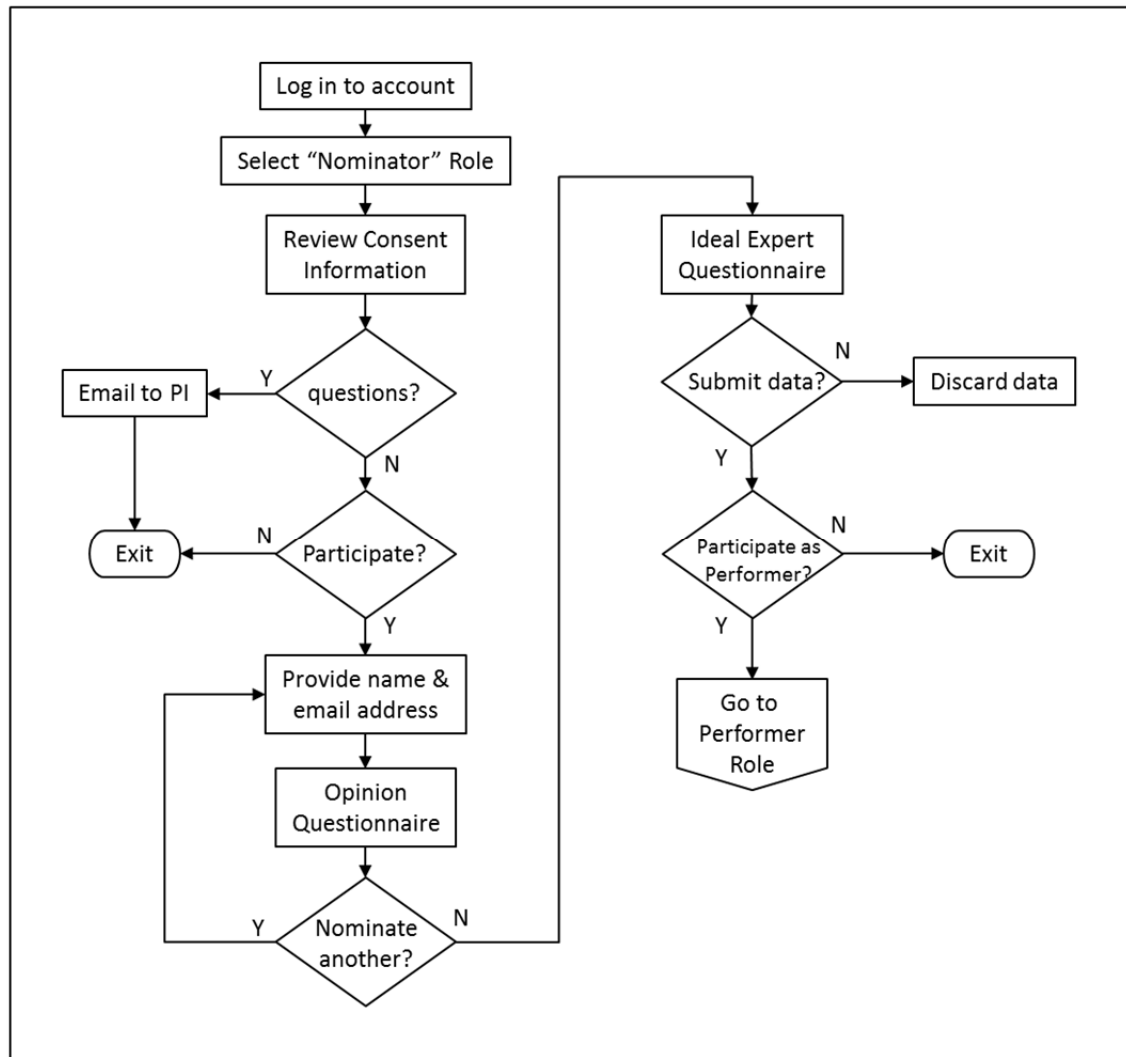
Figure 4-1: Nominator Procedure

3. If the participant consents to continue, then he/she will be transferred to the nominations page. On this page, the participant will record the name and email address of one or more nominees. (The email address will be used internally by the software application to keep track of the nominees and to account for multiple nominations of the same individual.) For each nominee, the participant will be asked to answer a set of opinion questions regarding the social skills and traits of the nominee (attached). When finished with each nominee and related opinion questions, the participant will submit the information and can then nominate an additional individual or move on to the remainder of the nomination task.

4. The software application will then check the email address of the nominee against the master database it maintains of all registered users of the system. If the email address does not match any registered user, the system will automatically generate and send an email to the nominee informing them that they have been nominated and providing recruitment materials to encourage them to participate in the experiment.

5. After the last performer candidate has been nominated, the participant will be asked to complete a short questionnaire that explores what skills and traits, in general, make up (at least, in the participant's opinion) the ideal cross-cultural expert. When the questionnaire has been completed, the participant will submit the data and move to the next page.

6. Finally, the participant will be offered a chance to participate in the experiment as a performer as well. If he/she elects to do so, the system will shift them to the "Performer" section as described in the next section. Otherwise, the participant will be thanked for his/her participation and will be logged off.

e. Performer Procedures

A participant that wishes to volunteer as a performer will follow the procedure that is described in more detail below and summarized in Figure 4-2. As was the case for the nomination process, the performer process will be handled completely by the Qualtrics software within the JHU/APL website. A performer may elect to withdraw his/her consent to participate at any time up to the final data submission and all experiment data (task results, questionnaire results, etc.) will be excluded from any analyses.

1. A participant who has volunteered to perform the experiment tasks will log into their account on the JHU/APL website (if not already logged on). He/she will then select the "Performer" role.

2. Once in the "Performer" section, the participant will be provided an electronic consent form (attached). If the participant understands the information and agrees to continue his/her participation, he/she may move on to the nomination process. If the participant has questions or concerns about the consent document, then he/she will be directed to send an email to the PI to obtain clarification, and will be permitted to logout and return after the questions or concerns have been answered. If the participant declines to consent to the form, then the session will be cancelled and the participant logged off.

3. If the participant consents to continue, then he/she will proceed to the background and experience survey page. On this page, the participant will be asked to answer a set of survey questions regarding his/her prior experience in social situations requiring cross-cultural adaptability (attached).

4. After completing the background and experience survey, the participant will move on to the set of experiment tasks described in Section 4.A.3, "Experiment Tasks," above. It is anticipated that completing these tasks will require the bulk of the participant's time and effort that is dedicated to this research effort. Although the tasks have been selected so that the entire effort can be completed in a single session of two hours or less, the participant will be given the option of saving his work at specific points during the testing and then continuing later during a separate session.
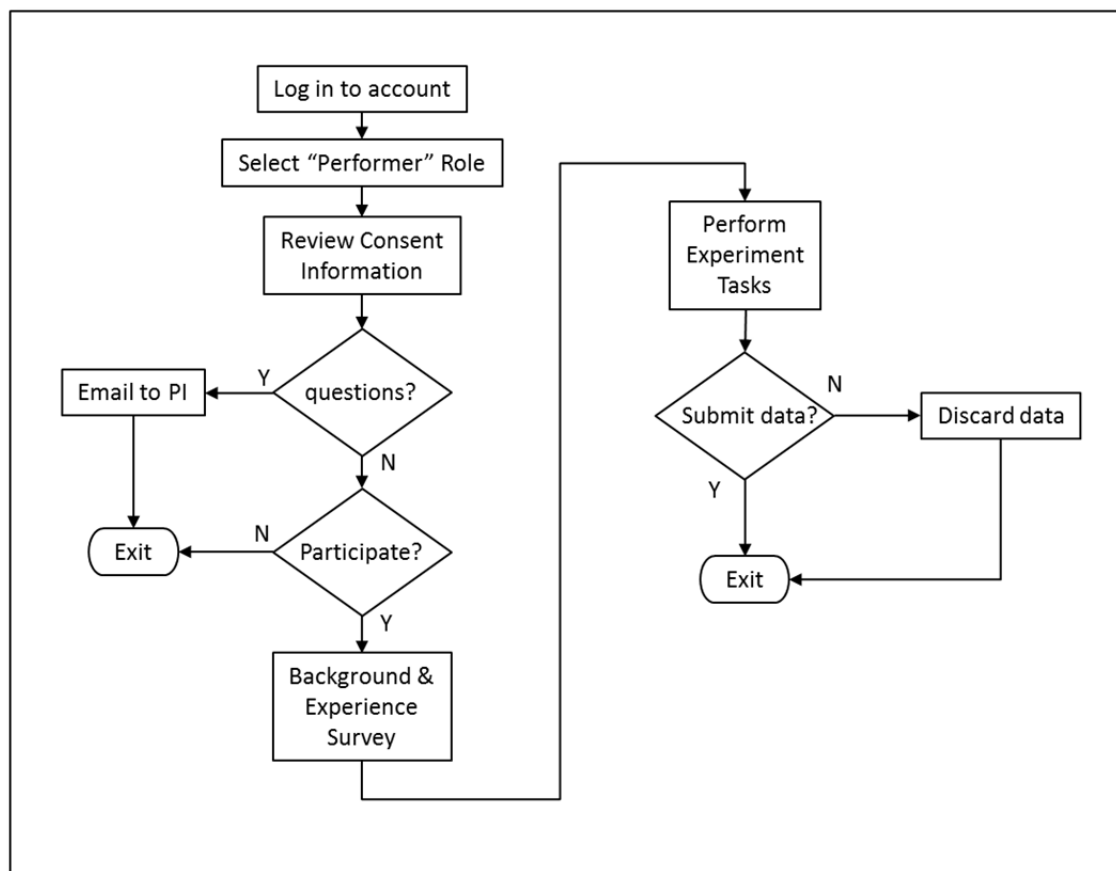

Figure 4-2: Performer procedure

5. Finally, the participant will be asked to submit the results using a button on the web page. Once the performer questionnaire has been completed, the participant will be locked out of the "performer" mode during any future sessions, with the intention of ensuring that only a single set of data will be collected from any given performer.

B. Study duration and number of study visits required of research participants.

The first phase of this study (the focus of this protocol) is expected to be completed by the end of this calendar year (2013). The associated data collection will occur over a maximum period of three months.

Participants will not 'visit' any research facility *per se*, as the experiment will conducted entirely online via the Internet. The participant may visit the web site as frequently as desired during a two week period following initial registration, after which the participant will no longer be allowed to access the site. Participants who volunteer as 'performers' will be allowed a maximum of one week to complete the associated questionnaires and performance tasks.

C. Blinding, including justification for blinding or not blinding the trial, if applicable.

Data collection will be performed entirely via the JHU/APL web site. No face-to-face interaction between the research team and the participants is envisioned. Any subjective evaluation of the experiment task data (e.g., judging the acceptability of participant responses in some of the 'mindreading' tasks) will be performed after the data has been de-identified. Consequently, no need is seen for blinding of the experiment.

D. Justification of why participants will not receive routine care or will have current therapy stopped.

N/A

E. Justification for inclusion of a placebo or non-treatment group.

N/A

F. Definition of treatment failure or participant removal criteria.

Participants will be removed from the study if they fail to complete the performer tasks within one week of commencing them.

G. Description of what happens to participants receiving therapy when study ends or if a participant's participation in the study ends prematurely.

N/A

5.   **Inclusion/Exclusion Criteria**

All participants will be adults, between 18 and 60 years of age. An effort will be made to recruit both male and female participants.

For the pilot studies, all participants will also be JHU/APL employees.

For the main experiment, additional inclusion criteria for all participants are:
1. have access to the Internet, the World Wide Web, and a personal email account, and
2. have the basic computer skills necessary to navigate a straightforward web site and perform the basic data entry activities commonly encountered on such sites (e.g., creating a password, clicking on action buttons, and entering freeform text).

For the main experiment, additional inclusion criteria for *performer* participants are:
1. must have traveled outside of the country at least once in the last five years

Volunteers with valid email addresses and whose computer skills are sufficient to allow them access to the experiment's web site will not be prevented from performing the tasks associated with the experiment. However, the data collected from any participant whose questionnaires or test score indicate that the individual does not meet the inclusion criteria listed above will be discarded prior to analysis and will not be incorporated into the final results.

6.   **Drugs/ Substances/ Devices**

No investigational drugs, substances, or devices will be utilized in this phase of the study.

a. The rationale for choosing the drug and dose or for choosing the device to be used.

N/A

b. Justification and safety information if FDA approved drugs will be administered for non-FDA approved indications or if doses or routes of administration or participant populations are changed.

N/A

c. Justification and safety information if non-FDA approved drugs without an IND will be administered.

N/A

7. Study Statistics

This study will ask participants to perform several standard psychology instruments (e.g., IQ tests) and a set of related performance tests (e.g., the cultural sensemaking task). The participants will all take the same battery of tests, but will be divided into two groups (namely, "expert" and "non-expert") for the purpose of data analysis. Consequently, this is a between-subjects design in which the outcome differences are assumed to result in the differences between the 'treatments' or 'manipulations' given to the two groups. In the case, the 'treatment' for this study is the subjective level of cross-cultural expertise possessed by each group, necessitating that the participants be selected for a given group based on their backgrounds and experience, rather than the random assignment to groups that is usually prescribed for a between-subjects experiment.

As a result, this study design is not a true experiment, in which the treatment is completely controlled by the experimenters, but is instead a correlational study based on the *classification variable* 'cross-cultural expertise,' or CCE, which substitutes here for the more common *independent variable* of a true experiment.

a. Primary outcome variable

The primary outcome variable is a vector-valued quantity that has been designated "cross-cultural potential" or CCP, as described below.

This study will collect a set of scores from the selected instruments and tasks that are performed by each performer participant. Some of the test scores will probably be correlated to each other to varying degrees, and some may demonstrate little correlation to the classification variable. The collection of test scores from each participant will be used to create a vector-valued variable, named "Test Scores." Factor analysis will be performed to create a transformation from the Test Score vector to a lower-dimensional vector, the CCP. The correlation between CCP and the classification variable CCE will then be calculated using multiple regression and correlation techniques.

b. Secondary outcome variables

No analyses of secondary outcome variables are planned.

c. Statistical plan including sample size justification and interim data analysis

The plan is to test a minimum of 150 participants. A power analysis was conducted using the G*Power application (version 3.1.6, © 2013 by Franz Faul, Universtaet Kiel,

Germany; http://www.psycho.uni-duesseldorf.de/abteilungen/aap/gpower3/) for a multiple regression and assuming the following parameters:

- effect size = 0.6 (recommended by Cohen, 1988, as a medium effect size)
- alpha = 0.05
- power (1 - beta) = 0.80
- number of predictors = 8 (the result was fairly insensitive to this value)

The power analysis resulted in a minimum sample size of 105 participants. Due to the minimal risk nature of the study and the lack of monetary compensation being offered to the participants, the costs of collecting a larger sample size are negligible. Consequently, a minimum sample size of 150 participants is recommended, though a larger sample size should be obtained if practicable within the time limits and the nature of the sought-after population.

d. Early stopping rules.

Due to the minimal risk nature of the protocol, no early stopping rule is necessary.

8. Risks

There are no risks to participants that are above minimal risk.

a. Medical risks, listing all procedures, their major and minor risks and expected frequency

There are no medical risks associated with this procedure above what would be normally encountered in every-day life situations.

b. Steps taken to minimize the risks

N/A

c. Plan for reporting unanticipated problems or study deviations

If unanticipated problems occur, or deviations from the approved protocol are noted or reported by any of the research staff, the collection of data (if ongoing) will be suspended, the JHM IRB will be notified of the discrepancy or problem, and the grant sponsor (ONR) will be informed. Data collection will not resume until corrective measures have been identified, the protocol updated/resubmitted/reapproved as necessary, and the permission of the JHM IRB to recommence the study has been obtained.

d. Legal risks such as the risks that would be associated with breach of confidentiality

The data to be collected will be de-identified prior to being analyzed by the research team. The risk of a breach of confidentiality has been minimized to the extent practicable.

e. Financial risks to the participants

There are no known or anticipated financial risks for the participants.

9. Benefits

There are no immediate benefits to the participants from this research.

The potential benefits to society are many. This basic science effort to understand the bases of intercultural adaptation is intended to lead to more applied studies focused on effective methods for teaching people of all cultures how to adapt rapidly and effectively to each other's cultural environment. Society, now more than ever, is dependent on the close cooperation between people from different cultures and nationalities to achieve the benefits of shared opportunities, capabilities and resources

while avoiding unnecessary conflict and violence.   In particular, by focusing on military personnel who have served in foreign countries, this study would quite naturally lead to greater opportunities for civil-military cooperation across cultural boundaries and lessen the likelihood of resorting to violence to achieve national aims.

10.   Payment and Remuneration

Participants in the pilot studies for the development of new stimuli will be APL employees who are by APL policies prohibited from accepting additional monetary payment from such participation.

Participants in the main experiment (both nominators and performers) will not be paid or remunerated for their efforts under this protocol. Likewise, no penalties will be assessed for any participant who fails to the complete the protocol for any reason.

11.   Costs

There are no costs to participants for participation in this effort other than the investment of their time, which is anticipated to be two hours or less for performers and considerably less for nominators. The costs associated with the development and support of the experiment website will be paid for by the research team.

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